

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Group Art Unit: 3634

Examiner: CHIN-SHUE, A.

In re application of: JONES, Keith D.)

Serial No.: 09/954,838)

Filed: September 12, 2001)

For: "ADJUSTABLE SAFETY LINE")

Confirmation No.: 8157

Mail Stop Appeal Brief – Patents
Commissioner for Patents
Post Office Box 1450
Alexandria, Virginia 22313-1450

September 5, 2007
Filed Electronically

SECOND AMENDED APPEAL BRIEF UNDER 37 C.F.R. § 41.37

INTRODUCTION

This is an appeal to the Board of Patent Appeals and Interferences of the final rejection of all claims in the subject application. This Amended Brief is submitted in response to the Notification of Non-Complaint Appeal Brief of August 8, 2007, and is in furtherance of Appellant's Notice of Appeal and Pre-Appeal Brief Request for Review under 37 C.F.R. § 41.31, filed February 26, 2007, the Amended Appeal Brief filed June 19, 2007, and the Final Office Action of December 28, 2006. This Brief is believed to be submitted timely; however, if any further extension is required, please consider this a request therefore. The Commissioner is authorized to charge any additional fees or credit any overpayment to Deposit Account 50-1513.

Appellant respectfully disagrees with the Notification of Non-Compliant Appeal Brief, as Appellant believes that nothing in 37 CFR §41.47(c)(vii) requires a subheading

CERTIFICATE OF EFS-WEB TRANSMISSION

I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via EFS-Web on the date indicated below.

/Michelle E. Kandcer/

Michelle E. Kandcer

September 5, 2007

Date

comprising the claim number when a rejection of single claim is made. Rather, the undersigned interprets the code to require a separate heading for each ground of rejection (which notably was included in Appellant's Appeal Brief) and a separate subheading when Appellant argues one or more claims separately (for each ground of rejection applying to two or more claims). Notably, the sections of this Appeal Brief where the Examiner is requiring subheadings are grounds of rejections applying to a single claim. Moreover, section 1205.03 of the MPEP states, "The examiner should not require a corrected brief for minor non-compliance in an appeal brief (e.g., the brief has a minor error in the title of a section heading)." Thus, even if a separate subheading is required (and Appellant maintains it is not), the Examiner still should not have required a corrected brief. This Notification of Non-Complaint Appeal Brief appears to be nothing more than a dilatory tactic by the Examiner to continue delaying final disposition of this case. Nevertheless to move forward, Appellant has amended the Brief to include the Examiner's suggestions rather than spending more of Appellant's time and resources by petitioning the Director or the Chief Administrative Patent Judge.

1. REAL PARTY IN INTEREST

The real party in interest is the owner of the present application, Summit Treestands, LLC (the assignee of this application) of 715 Summit Drive, SE, Decatur, Alabama 35601.

2. RELATED APPEALS AND INTERFERENCES

There is one other known appeal that is related to the present case. Namely, U.S. Patent Application Serial No. 10/982,033, filed on November 5, 2004, which is a divisional of the present application, is currently under appeal.

There are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this Appeal.

3. STATUS OF CLAIMS

Claims 9-11, 13-17, and 22 remain in this Application and stand finally rejected, of which claims 15, 17, and 22 were previously withdrawn. Claims 1-8, 12, and 18-21 were previously cancelled. Pursuant to 37 C.F.R. § 1.141, Appellant notes that upon the allowance of a generic claim, Appellant is entitled to and hereby requests consideration of claims 15 and 17 directed to the other disclosed species.

The appealed claims are Claims 9-11 and 13-17.

4. STATUS OF AMENDMENTS

No amendments after final were filed.

5. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed invention of independent claim 9 relates generally to a safety rope system for preventing injury to a user should the user fall from an elevated position. The user is supported in the elevated position by a platform, seat, or other device (see tree stand 12, Figure 1), but the user is not supported by the safety rope system except

in the case of a fall from, or failure of, the platform, seat, or other device. Referring to Figure 1, the system includes a safety harness 16 to be worn by the user (see page 2, lines 30-31 and Figure 1); a standing rope line 30 for attachment to a tree 14, pole, or the like, with a first end of the standing rope line being adapted to be secured to the tree, pole, or the like (see page 4, lines 6-7 and Figure 2); and a sliding rope coupler 50 for attaching the safety harness to the standing rope line (see page 4, line 20 through page 5, line 7 and Figures 2 and 3). The sliding rope coupler 50 comprises a length of rope with multiple loops wrapped about the standing line of rope to be slidable along at least a portion of the length of the standing rope line (see page 5, lines 8-17 and Figures 3A through 3F). The ends of the sliding rope coupler 50 are joined together for attaching the safety harness 16 thereadjacent (see page 5, lines 8-17 and Figures 2 and 3). The sliding rope coupler 50 is freely repositionable along the standing rope line 30 when not loaded, but resists sudden downward movement relative to said standing rope line when under load (see page 5, line 31 through page 6, line 4). Thus, the safety harness 16, the standing rope line 30, and the sliding rope coupler 50 do not support the weight of the user except in the event that the platform, seat, or other device should fail or the user should fall off thereof.

Preferably, the sliding rope coupler 50 comprises a Prusik hitch, as recited in dependent claim 14 (see page 5, lines 4-5). The sliding rope coupler 50 can be made from a rope that has a smaller diameter than that of the standing rope line, as recited in claim 13 (see page 5, lines 8-9). The safety harness can comprise a belt, as recited in claim 16, or a multi-point body harness, as recited in claim 17, currently withdrawn (see page 3, lines 30-31).

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- (1) Whether claims 9, 10, 14, and 16 are anticipated under 35 U.S.C. §102(b) by G.B. Patent No. 2259855A of *Miller*;
- (2) Whether claim 11 is unpatentable under 35 U.S.C. §103(a) over the combination of G.B. Patent No. 2259855A of *Miller* in view of U.S. Patent No. 4,493,391 of *Van Patten*;
- (3) Whether claim 13 is unpatentable under 35 U.S.C. §103(a) over the combination of G.B. Patent No. 2259855A of *Miller* in view of U.S. Patent No. 6,059,266 of *Ascherin et al.*;
- (4) Whether claim 16 is unpatentable under 35 U.S.C. §103(a) over G.B. Patent No. 2259855A of *Miller* in view of U.S. Patent No. 4,090,584 of *Wagner*; and
- (5) Whether dependent claims 15 and 17, which are currently withdrawn and are directed to another disclosed species, are allowable over the art of record.

7. ARGUMENT

A. Claim Rejections under 35 U.S.C. § 102(b) – *Miller*

Claims 9, 10, and 14

Claims 9, 10, and 14 stand rejected under 35 U.S.C. §102(b) as being anticipated by Great Britain Patent No. 2,259,855 of *Miller*. This rejection is erroneous and cannot be sustained.

The §102(b) rejection is improper because the cited reference fails to disclose every element in the claimed invention. Although the Examiner has taken the position that *Miller* anticipates the present claims, Appellant respectfully points out that the *Miller*

reference discloses the use of a Prusik hitch for purposes other than what is claimed. In particular, the *Miller* reference discloses using a Prusik hitch for climbing a tree and for lowering a load. Simply stated, this is not what is claimed. Obviously, the Appellant has not invented the Prusik hitch. Instead, the Appellant has discovered that through the use of a Prusik hitch, an improved safety harness arrangement can be achieved.

In the *Miller* reference, the Prusik hitch is used as a tool for climbing or lifting a load. If during the climb, the climber becomes incapacitated, the *Miller* invention provides a device that allows a person other than the climber to remotely apply pressure on the Prusik knot so as to lower the load while controlling the rate of descent of the load. However, climbing and lowering a load are not the purposes or goals of the present invention. Instead, the present invention is directed to avoiding injury should someone begin to fall from an elevated position. Once the person has fallen, climbing back up or lowering the load is not part of the claimed invention. In the claimed safety device, the Prusik hitch is used to arrest the user's fall. The Appellant has discovered that the Prusik hitch becomes progressively tighter as the user falls, thereby providing a progressive braking action. This progressive braking action provides improved safety in that it avoids the sudden snap or jerk at the end of the fall as happens when a conventional safety line reaches its length limit. The Prusik hitch employed in the present invention allows some "give" due to the sliding nature and progressive braking such that the falling user is progressively slowed until he is ultimately stopped, rather than being stopped all once.

Simply stated, the *Miller* rope and knot are constantly load-bearing, or in other words, the rope and the particular knot constantly support the weight of the user. The

cited prior art shows active use of a knot for climbing and lowering a load but does not show passive use of a rope knot for arresting a fall. The present invention, however, relates to and claims a safety line using a knot passively for arresting a fall. Claim 9, the sole independent claim, recites:

A safety rope system for preventing injury to a user should the user fall from an elevated position, the user being supported in the elevated position by a platform, seat, or other device, the user not being supported by the safety rope system except in the case of a fall from, or failure of, the platform, seat, or other device, the safety rope system comprising:

a safety harness to be worn by the user;

a standing rope line for attachment to a tree, pole, or the like, with a first end of the standing rope line being adapted to be secured to the tree, pole, or the like; and

a sliding rope coupler for attaching the safety harness to the standing rope line, the sliding rope coupler comprising a length of rope with multiple loops wrapped about the standing line of rope to be slidable along at least a portion of the length of the standing rope line, with the sliding rope coupler having its ends joined together for attaching the safety harness thereadjacent, wherein said sliding rope coupler is freely repositionable along said standing rope line when not loaded, but resists sudden downward movement relative to said standing rope line when under load,

wherein the safety harness, the standing rope line, and the sliding rope coupler do not support the weight of the user except in the event that the platform, seat, or other device should fail or the user should fall off thereof.
(emphasis added).

Clearly, the *Miller* reference does not disclose, teach, or suggest, not even inherently, the passive use of the sliding rope coupler, as claimed. Thus, Claim 9, as well as Claims 10 and 14 that depend from Claim 9, are distinguishable from *Miller*. Accordingly, the Examiner has failed to establish a *prima facie* §102(b) rejection, and

Appellant respectfully requests reconsideration and withdrawal of the §102(b) rejection and allowance of Claims 9, 10, and 14.

Claim 16

Claim 16 stands rejected under 35 U.S.C. §102(b) as being anticipated by Great Britain Patent No. 2,259,855 of *Miller*. This rejection is erroneous and cannot be sustained.

As admitted by the Examiner on page 3 of the Final Office Action of December 28, 2006, “*Miller* shows the claimed system with the exception of the belt harness.” Without agreeing with the Examiner’s assertions of what the *Miller* reference discloses, Appellant agrees that *Miller* does not show at least the feature of the belt harness. Accordingly, Appellant respectfully requests withdrawal of the §102(b) rejection and allowance of Claim 16.

B. Claim Rejections under 35 U.S.C. § 103(a) – *Miller* and *Van Patten*

Claim 11

Claim 11 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Miller* in view of *Van Patten*. This rejection is erroneous and cannot be sustained.

Van Patten fails to cure the deficiencies of *Miller* as *Van Patten* fails to disclose, teach, or suggest the passive use of a sliding rope coupler or Prusik knot. In fact, *Van Patten* does not disclose the use of Prusik knot in any manner. Rather, *Van Patten* discloses a metal structure. Simply stated, neither *Miller* nor *Van Patten* discloses the use of a Prusik hitch for arresting a fall, taking advantage of the sliding connection of a

Prusik hitch to provide braking, as claimed. Accordingly, the Examiner has failed to establish a *prima facie* §103(a) rejection. Reconsideration and withdrawal of the §103(a) rejection is respectfully requested.

C. Claim Rejections under 35 U.S.C. § 103(a) – *Miller and Ascherin et al.*

Claim 13

Claim 13 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Miller* in view of *Ascherin et al.* This rejection is erroneous and cannot be sustained.

Ascherin et al. fails to cure the deficiencies of *Miller*. Although the *Ascherin* patent does disclose a Prusik hitch, the *Ascherin* patent shows the use of a Prusik hitch as a sort of clutch for a winch used in rescue of a fallen person. Like *Miller*, *Ascherin et al.* fails to disclose, teach, or suggest the use of a Prusik hitch for arresting a fall, taking advantage of the sliding connection of a Prusik hitch to provide braking, as claimed. Accordingly, the Examiner has failed to establish a *prima facie* §103(a) rejection.

Moreover, there is no discussion regarding diameter of the line comprising the Prusik knot which would lead one of skill in the art to this limitation recited in Claim 13 (that the sliding rope coupler is made from a rope that has a smaller diameter than that of the standing rope line). Presumably, the diameters of the line 50 and the line 90 of *Ascherin et al.* are the same, namely a one-half inch static, kernmantle rope (see column 3, lines 1-15). Accordingly, the Examiner has failed to establish a *prima facie* §103(a) rejection. Reconsideration and withdrawal of the §103(a) rejection is respectfully requested.

D. Claim Rejections under 35 U.S.C. § 103(a) – *Miller and Wagner*

Claim 16

Claim 16 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Miller* in view of *Wagner*. This rejection is erroneous and cannot be sustained.

Wagner fails to cure the deficiencies of *Miller* as *Wagner* fails to disclose, teach, or suggest the passive use of a sliding rope coupler or Prusik knot. In fact, *Wagner* does not disclose the use of Prusik knot in any manner. Rather, *Wagner* discloses a metal structure. Simply stated, the combination of *Miller* and *Wagner* does not disclose, teach, or suggest the use of a Prusik hitch for arresting a fall, taking advantage of the sliding connection of a Prusik hitch to provide braking, as claimed. Accordingly, the Examiner has failed to establish a *prima facie* §103(a) rejection. Reconsideration and withdrawal of the §103(a) rejection is respectfully requested.

E. Declaration Under Rule 1.132 Regarding Secondary Considerations of Non-Obviousness

*Nowhere in the prior art is it taught or suggested the **passive use of a rope knot** for arresting a fall.* In fact, this very discovery by the Appellant has been commercially successful for the assignee of the present application and subsequently has been adopted and copied by others, including at least four competitors, who became aware of it from the Appellant, as evidenced by the *Declaration Under Rule 1.132 Regarding Secondary Considerations of Non-Obviousness* filed on May 16, 2006. "Objective evidence or secondary considerations such as ... commercial success, long-felt need, failure of others, copying by others, ... are relevant to the issue of obviousness and

must be considered in every case in which they are present. When evidence of any of these secondary considerations is submitted, the examiner must evaluate the evidence." M.P.E.P. § 2141, *citing Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 U.S.P.Q. (BNA) 871 (Fed. Cir. 1983); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 U.S.P.Q. (BNA) 81 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987). "The ultimate determination on patentability is made on the entire record." *Id.*

For at least this additional reason, Appellant respectfully submits that Claims 11, 13, and 16 would not have been obvious to a person of ordinary skill in the art in view of the teachings of *Miller*, *Van Patten*, *Ascherin et al*, and *Wagner* and respectfully request reconsideration and withdrawal of this rejection.

F. Claims 15 and 17

Pursuant to 37 C.F.R. § 1.141, Appellant notes that upon the allowance of a generic claim, Appellant is entitled to consideration of claims to the other disclosed species. Appellant believes that at least independent claim 9 is generic and allowable. Accordingly, for at least the reason that dependent Claims 15 and 17 incorporate the limitations of independent Claim 9, Appellant requests allowance of Claims 15 and 17.

CONCLUSION

In view of the above and the attached appendices, the pending grounds of rejection cannot be maintained and all pending claims must be allowed. Any communication that may expedite allowance should be directed to Appellant's undersigned attorney at (770) 984-2300.

Respectfully submitted,
GARDNER GROFF GREENWALD &
VILLANUEVA, P.C.

/Michelle E. Kandcer/

Michelle E. Kandcer, Reg. No. 54,207

Customer No. 23506
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8. CLAIMS APPENDIX

9. A safety rope system for preventing injury to a user should the user fall from an elevated position, the user being supported in the elevated position by a platform, seat, or other device, the user not being supported by the safety rope system except in the case of a fall from, or failure of, the platform, seat, or other device, the safety rope system comprising:

a safety harness to be worn by the user;

a standing rope line for attachment to a tree, pole, or the like, with a first end of the standing rope line being adapted to be secured to the tree, pole, or the like; and

a sliding rope coupler for attaching the safety harness to the standing rope line, the sliding rope coupler comprising a length of rope with multiple loops wrapped about the standing line of rope to be slidable along at least a portion of the length of the standing rope line, with the sliding rope coupler having its ends joined together for attaching the safety harness thereadjacent, wherein said sliding rope coupler is freely repositionable along said standing rope line when not loaded, but resists sudden downward movement relative to said standing rope line when under load,

wherein the safety harness, the standing rope line, and the sliding rope coupler do not support the weight of the user except in the event that the platform, seat, or other device should fail or the user should fall off thereof.

10. The safety rope system of Claim 9, wherein said the first end of the standing rope line comprises a looped portion.

11. The safety rope system of Claim 9, wherein said standing rope line comprises a clip.
13. The safety rope system of Claim 9, wherein the sliding rope coupler is made from a rope that has a smaller diameter than that of the standing rope line.
14. The safety rope system of Claim 9, wherein the sliding rope coupler comprises a Prusik hitch.
15. The safety rope system of Claim 9, further comprising a carabiner for releasably securing the sliding rope coupler to the safety harness.
16. The safety rope system of Claim 9, wherein said safety harness comprises a belt.
17. The safety rope system of Claim 9, wherein said safety harness comprises a multi-point body harness.

9. EVIDENCE APPENDIX

A Declaration Under Rule 1.132 Regarding Secondary Considerations of Non-Obviousness was filed in the present application on May 16, 2006 and is relied upon herein by the Appellant. A true and correct copy of the Rule 1.132 Declaration is attached hereto.

Other evidence entered by the Examiner and relied on by the Appellant in this appeal includes:

- (1) U.S. Patent No. 4,493,391 of *Van Patten*, as entered by the Examiner in the Office Action of October 3, 2002;
- (2) U.S. Patent No. 6,059,266 of *Ascherin et al.* as entered by the Examiner in the Office Action of October 3, 2002;
- (3) Great Britain Patent Number 2259855A of *Miller* as entered by the Examiner in the Office Action of June 24, 2006; and
- (4) U.S. Patent No. 4,090,584 of *Wagner* as entered by the Examiner in the Office Action of May 16, 2003.

No other evidence pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 was entered by the Examiner and relied upon the Appellant in the appeal.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: JONES, Keith D.)	
)	
Serial No.: 09/954,838)	Art Group: 3634
)	
Filed: September 12, 2001)	Examiner: CHIN-SHUE, A.
)	
For: "ADJUSTABLE SAFETY LINE")	Confirmation No.: 8157

Mail Stop **Amendment**
Commissioner for Patents
Post Office Box 1450
Alexandria, Virginia 22313-1450

May 18, 2006

SUBMISSION OF DECLARATION OF NON-OBVIOUSNESS

Dear Sir:

CERTIFICATE OF MAILING

I hereby certify that this correspondence and the papers indicated to be attached are being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on this 18th day of May, 2006.



Alicia Howell

May 18, 2006
Date

This Applicant submits herewith a photocopy of a Declaration Under Rule 1.132 Regarding Secondary Considerations of Non-Obviousness, as signed by the Assignee in connection with a related application.

The Examiner is requested to consider the evidence of this Declaration and submit a favorable response.

Should there be any additional matters to discuss, Applicant kindly requests the Examiner to contact the undersigned attorney.

Respectfully submitted,

GARDNER GROFF SANTOS &
GREENWALD, P.C.

A handwritten signature in black ink, appearing to read 'Arthur A. Gardner', is written over a horizontal line.

Arthur A. Gardner
Reg. No. 33,887

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: JONES, D. Keith)	
Serial No.: 40/992,030)	Art Group: 3624
Filed: November 5, 2004)	Examiner: CHIN SHUE, Alvin C.
For: ADJUSTABLE SAFETY LINE)	Confirmation No.: 8834
)	

Mail Stop Amendment
Commissioner for Patents
Post Office Box 1450
Alexandria, Virginia 22313-1450

May 15, 2006

Declaration Under Rule 1.132 Regarding
Secondary Considerations of Non-Obviousness

Sir:

The following Declaration is submitted with the Response responsive to the Office Action mailed January 9, 2006.

COPY

CERTIFICATE OF MAILING

I hereby certify that this correspondence and the papers indicated to be attached are being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner For Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on this 15th day of May 2006.

Ah

Printed Name: Alicia Howell

may 15, 2006

Date

I, BRADLEY FITZGERALD, HEREBY DECLARE:

1. I am the Production Engineer of Summit Treestands, LLC (hereinafter referred to as "Summit"), the assignee of the entire right, title, and interest of the present application.
2. I am familiar with the invention of the present application and am well acquainted with the subject matter thereof.
3. Summit has been selling a device, an adjustable safety line or "safety rope" (as it is called by Summit) to be used with the claimed method of the present application, since around 2002, as shown in Exhibit 1. Exhibit 1 also includes instructions for using the safety rope. As shown and described in the "Instructions for using the Safety Rope," a method for preventing injury to a user due to a fall from an elevated position using a safety rope system includes the steps of
 - securing a standing rope line of the safety rope system to a tree, pole or the like adjacent the elevated position; (steps 1 and 2)
 - slidably connecting a sliding rope coupler of the safety rope system comprising a prusik hitch to the standing rope line, whereby the sliding rope coupler is freely movable along the standing line when not loaded, but resists movement relative to the standing line when under load; (step 3)
 - coupling the sliding rope coupler to a harness worn by the user; (step 3) and
 - from time to time repositioning the sliding rope coupler along the standing line as needed, (step 4)
 - whereupon in the event the user should fall from the elevated position the sliding rope coupler comprising a prusik hitch grabs against the standing rope line to act as a brake to arrest the fall of the user and wherein the harness, the standing rope line, and the sliding rope coupler do not support the weight of the user except in the event that the platform, seat, or other device should fail or the user should fall off thereof. (as implied in step 6).
4. Since 2002, Summit has sold at least 4,260 adjustable safety ropes, for use with the claimed method of the present invention. Additionally, since 2002, Summit has sold

at least 304,381 treestands and at least 61,346 harnesses, which each incorporate the adjustable safety rope to be used with the claimed method of the present invention.

5. Since Summit began selling its adjustable safety line, North Starr Treestands Inc. of Hillsdale, Michigan began copying the adjustable safety line of the present invention and its method of use. A copy of a photo of the North Starr safety line, which is identical to the adjustable safety line of the present invention, is attached hereto as Exhibit 2. Thus, as the North Starr device includes at least a sliding rope coupler comprising a prusik hitch coupled to a standing rope line, the North Starr device can be used to practice the claimed method of the present invention.

6. Since Summit began selling its adjustable safety line, Lone Wolf of Milwaukee, Wisconsin began copying the adjustable safety line of the present invention and its method of use. A copy of a photo of Lone Wolf's safety line, the Lone Wolf Caribiner & Rope Assembly, and instructions for use are attached hereto as Exhibit 3. The Lone Wolf Caribiner & Rope includes at least a sliding rope coupler comprising a prusik hitch coupled to a standing rope line, which can be used to practice the claimed method of the present invention.

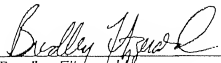
7. Since Summit began selling its adjustable safety line, Hunting Products Research, Inc., of El Dorado, Arkansas, under the brand Loggy Bayou, began copying the adjustable safety line of the present invention and its method of use. A copy of a photo of the Loggy Bayou safety line is attached hereto as Exhibit 4. The Loggy Bayou safety line includes at least a sliding rope coupler comprising a prusik hitch coupled to a standing rope line, which can be used to practice the claimed method of the present invention.

8. Since Summit began selling its adjustable safety line, The Hunter Safety System of Danville, Alabama began copying the adjustable safety line of the present invention and its method of use. A copy of a photo of The Hunter Safety System safety line is attached hereto as Exhibit 5. The Hunter Safety System's safety line includes at least a sliding rope coupler comprising a prusik hitch coupled to a standing rope line, which can be used to practice the claimed method of the present invention.

9. The adoption and copying by Summit's competitors, namely North Starr, Lone Wolf, Hunting Products Research, Inc. (Loggy Bayou), and Hunter Safety Systems, of the invention disclosed and claimed in the present application is evidence of its non-obviousness in view of the prior art.

10. None of these competitors were selling such an adjustable safety line until the introduction by Summit (the assignee of this patent application) of this invention into the market. In just four years, these four (4) competitors have copied this design.

11. I further declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine, imprisonment, or both, under 35 U.S.C. Title 18 § 1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.


Bradley Fitzgerald
Title: Production Engineer
Summit Treestands, LLC

Executed on: May 15, 2006

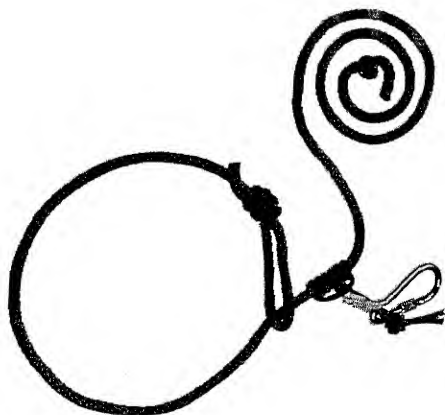
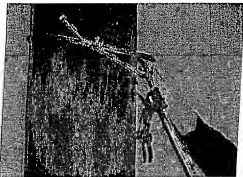


EXHIBIT 1

Instructions for using the Safety Rope

WARNING!

When attaching the safety line to the tree, be sure the adjustable prussic hitch has been completely inserted through the loop at the end of the safety rope as shown in (FIG 7).
FIG 7



This must be done **BEFORE** you begin to climb with a climbing treestand. Always adjust the safety rope to minimize the slack. **NEVER** allow more than 36 inches total combined slack in the rope and tether strap. The more slack you have in the safety line, the farther you will fall. This may result in injury or prevent you from returning to the tree stand after falling.

The adjustable prussic hitch should be snug to the safety line. It should be tight when sliding it on the safety rope. If necessary, gently pull on the prussic loop to increase the tension of the prussic on the safety rope.

1. Put the loop end of the safety rope around the tree.
2. Thread the knot end and the adjustable prussic hitch all the way through the loop end of the safety rope (FIG 7).
3. Open the prussic hitch loop and insert the harness tether safety clip through this loop as shown in (FIG 8). Screw the locking collar completely closed to secure the safety clip.

FIG 8



4. Slide the adjustable prussic hitch up the safety rope to a comfortable hunting position and pull on the end of the prussic hitch to secure it to the safety rope see (FIG 9).

FIG 9



5. Tie an overhand knot in the safety rope about a foot under the prussic hitch (FIG 10). This will help maintain your position on the safety rope in the event of a fall.

FIG 10



6. This is an adjustable safety rope. Always adjust the safety rope to minimize the slack needed for hunting. **NEVER** allow more than 36 inches total combined slack in the rope and tether strap (FIG 11). The more slack you have in the safety line, the farther you will fall. This may result in injury or prevent you from returning to the tree stand after falling.

FIG 11



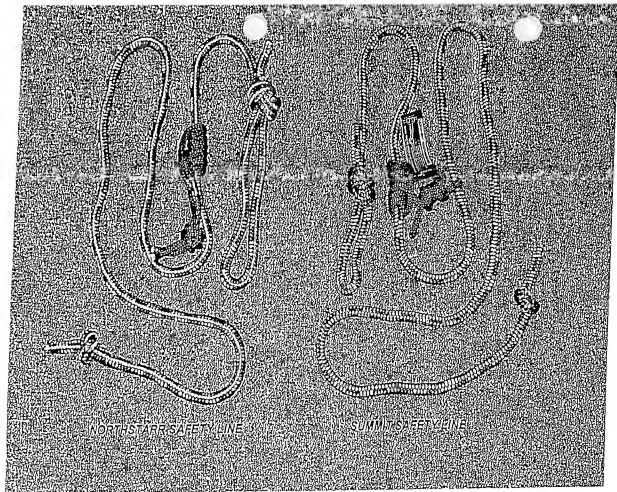


EXHIBIT 2

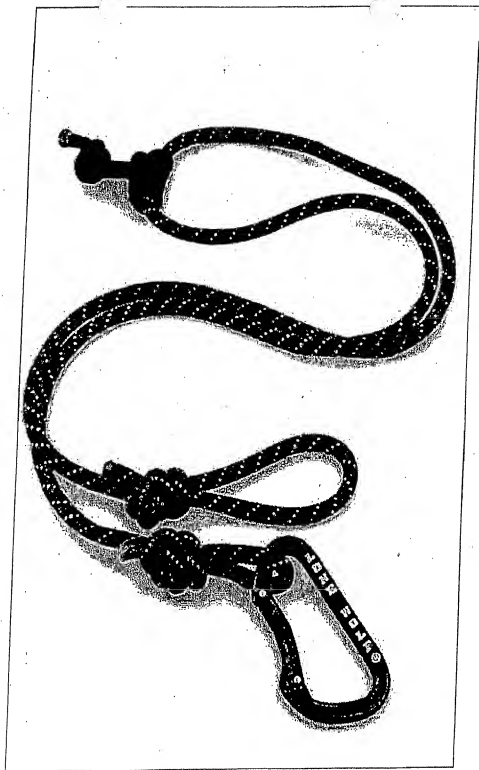


EXHIBIT 3

LONE WOLFTM

PORTABLE TREE STANDS

PRODUCT LINE INSTRUCTIONS

WARNING:

Failure to respect any of these warnings can result in severe injury or death.

- Make sure you have read and understand all instructions.
- Practice first at ground level.
- You are responsible for your own actions and decisions.
- Familiarize yourself with your equipments capabilities and limitations.
- Do not use while intoxicated or when taking medications that cause drowsiness.
- Do not attach to rotten, loose bark or dead trees, metal or utility poles.
- Avoid use during wet or icy conditions, or during lightning storms.
- Do not attempt to alter product in any way.
- Maximum load is 350 pounds.

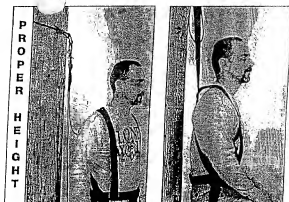
GENERAL MAINTENANCE

- Inspect before each use.
- Replace every 5 years.
- Replace after arresting a fall.
- Or earlier if belts or ropes are cut or worn.

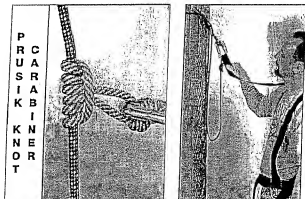
If you do not understand any of these instructions,
please call Customer Service or visit our web site.

Lone Wolf Inc. • 5411 S. 9th Street
Milwaukee, WI 53221 • 1-414-744-4984
www.lonewolfstands.com

KEY POINTS:

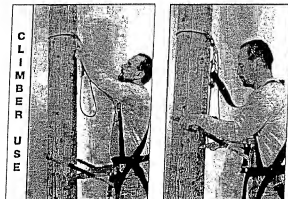


The proper height to attach ropes around tree is a height which will result in a tight tether when in a seated position.

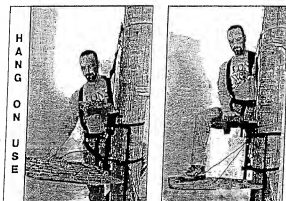


Always make sure your prusik knot has six (6) loops. Do not remove carabiner from prusik knot.

Always attach small loop on rope to carabiner prior to attaching back harness strap.

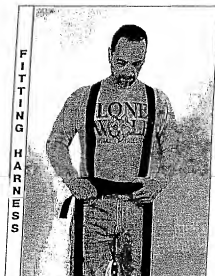


Always connect to tree before leaving ground. Always move tree attachment before advancing climbing stand in a frequency consistent with keeping the tether as short as possible to reduce length of a possible fall.

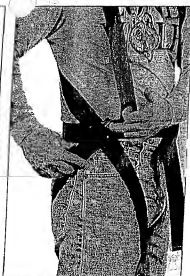


Always connect to tree before setting stand. Attachment should be at a height to allow you to step onto stand. The final height adjustment is made after you step onto platform (see first key point).

LL ARREST SYSTEM INSTRUCTIONS



STEP 1: Place harness on shoulders. Thread belt through waist buckle.



STEP 2: Adjust leg straps with slide. Hook should be level with waist belt.



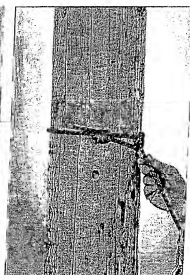
STEP 3: Reach under belt with one hand and pull hook under waist belt.



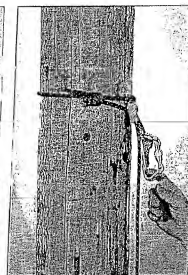
STEP 4: Place hook on top of waist buckle. Repeat steps 2 3 4 on opposite side.



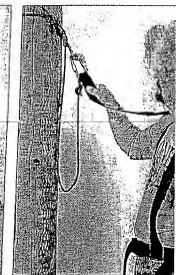
STEP 1: Wrap rope around tree. Thread carabiner and prusik knot through large loop, go through 2 times.



STEP 2: Pull rope tight as shown.



STEP 3: Slide prusik knot up to loop and pull on carabiner to make sure prusik knot is locking on to larger rope



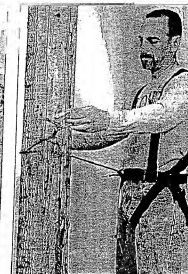
STEP 4: Attach remaining small loop and back harness strap on to carabiner.



STEP 1: Place rope tether large loop under waist belt as shown.



STEP 2: Thread remainder of rope and carabiner through large loop and pull tight.



STEP 3: Wrap rope and carabiner around tree.



STEP 4: Hook carabiner through waist belt buckle loop (slide prusik knot for adjusting length).

LINE MANS TETHER

6-Point Fall Arrest System

LO
WOLF
YOUR STRAIGHT

Finally, a 6-point fall arrest system that's good enough to call a **Lone Wolf**.

Easy to use and quick to set up, there's simply no reason NOT to use one EVERY time you climb, sit and descend from the stand.

FEATURES:

- Heavy-duty nylon construction
- Fully adjustable for a customized fit
- Quick-set leg clasps, no straps to thread in the dark!
- 350-pound rating
- TMA approved
- **LIGHTWEIGHT!** A third the weight of other harness systems

Quick-Set Leg Clasp

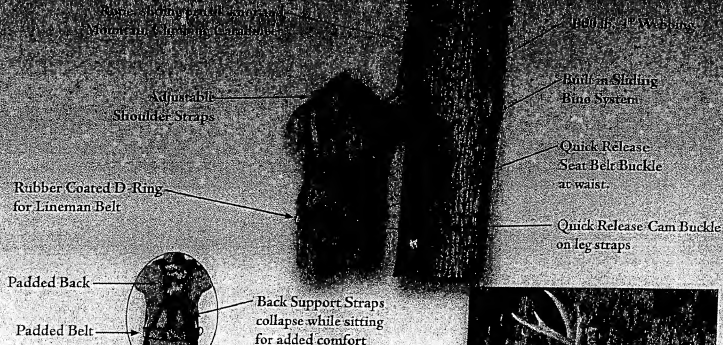
No more strap adjustments or burrs to thread in the dark. The Quick-Set Leg Clasps hook onto the wrist strap in one easy step.

Stay Connected

The carabiner/rope attach system assures a rock solid connection.

Transformer™ Safety System

"The Future of Hunter Safety"



"As I get older and have more people dependent upon me, I naturally get more safety conscious. There is nothing more important to the tree stand hunter than a good safety harness. The Transformer Safety System is lightweight, simple, fast but most importantly it does not interfere with your bow string."

Bill Winke - Whitetail Expert



Tree Strap (Part #3025)



Padded Back (Part #3110)



Padded Waist (Part #3120)



Hip Quiver (6 arrow) (Part #3130)

Tech. Specs.	Size	Max Waist	Max Height	Wt. Cap.	Camo
Transformer™ Safety System Model # 3020 (Patent Pending) Sug. Retail \$79.99	L	34"	6' 2"	300 lbs.	Mossy Oak® New Break-Up®
Transformer™ Safety System XL Model # 3030 (Patent Pending) Sug. Retail \$84.99	XL	44"	6' 6"	350 lbs.	Mossy Oak® New Break-Up®

Other unique products from the "safety professionals".

The Silent System™

Hunter Safety System offers The Silent System™ for hunters who want a quiet climb. This adhesive-backed, canvas covered Neoprene-like tape is one-of-a-kind. Wide enough for any stand, permanent after curing and available in camo. The Silent System™ can dampen any metal "clink" from arrows, gun barrels, pack buckles and more. Also insulates cold metal stands to keep feet warm for extended stays up a tree. Includes extra camo tape for corner reinforcement. See photos at right. 4in. X 20ft.

Measure and cut The Silent System™ to fit the stand member to be covered.

Glow Clips™

Punch into your pocket, grab a clip (don't worry about getting stuck by a tail), clip it on a bush as you walk by, simple. Makes an easily visible trail day or night and can be removed as easily as it can be applied. Perfect for hunting a new spot once or twice. Great yardage and blood trail markers, too.

The Lineman's Belt

The new Lineman's Belt snaps directly to special "D" Rings or loops on the side of the Hunter Safety System™ vest for hands-free work while hanging lock-on style stands or adding a safety strap to any ladder-style climbing situation.

Hold the piece in place and peel and stick the first portion in place. Then work across the stand as you peel backing away.

Quick-Connect Tree Strap™

Hunter Safety System has developed the new HSS Quick-Connect tree strap for 2006. Once attached to the tree, this simple connection can be left in place thru the majority of the season. It takes only seconds for the hunter to be safely attached to the tree and ready to hunt.

Life Line

Life Line makes the climbing portion of your hunt safer by allowing a special "positive-stop" knot to slide up the standing "life line" as you climb. Install it the first time you're up the tree and every climb after that is safe without the need for a tree strap as you climb. A must for locking stands and ladders.

Wrap and cut for cross-members as needed to finish application. Adhesive will cure to permanent within 48 hours.

Logo Caps

Show you're a safe hunter with these handsome caps in popular Realtree® Hardwoods® pattern with direct embroidery of Hunter Safety System logo. Also available in Mossy Oak Break-up.

Hunter Safety System, Inc. • 8237 Danville Road • Danville AL 35619
1.877.296.3528 • www.huntersafetyssystem.com

United States Patent [19]

Van Patten

[11] Patent Number: 4,493,391

[45] Date of Patent: Jan. 15, 1985

[54] SAFETY LOWERING DEVICE

[76] Inventor: Preston J. Van Patten, 15 Lynn Dr.,
Scotia, N.Y. 12302

[21] Appl. No.: 383,966

[22] Filed: Jun. 1, 1982

[51] Int. Cl.² A62B 1/16

[52] U.S. Cl. 182/6; 182/7;
188/65.2

[58] Field of Search 188/65.1, 65.2, 65.3,
188/65.4, 65.5; 182/3, 5, 4, 6, 7, 9, 10, 11

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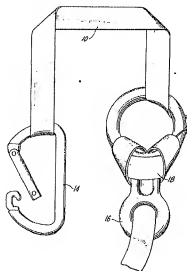
Primary Examiner—Reinaldo P. Machado

Assistant Examiner—A. Chin-Shue

[57] ABSTRACT

A self-contained safety device for self-lowering a person comprises an elongated high-strength safety webbing to support a person and a reel for releasably housing said webbing. The device comprises a generally figure 8 shaped member having two aligned apertures, a seat comprising a non-slip buckle means and two elongated seat webbings to form a big hole and one-half of waste hole. A friction knot is formed by passing the safety webbing through one aperture of the figure 8 member, said friction knot being manipulatable to extend the webbing at a controlled rate, and means at the free end of the safety webbing for anchoring the web during lowering of the person.

6 Claims, 5 Drawing Figures



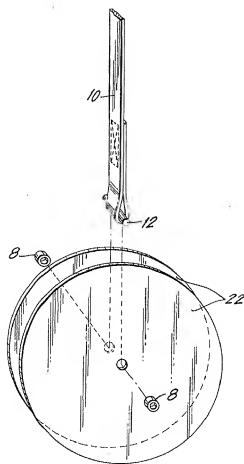


FIG. 1

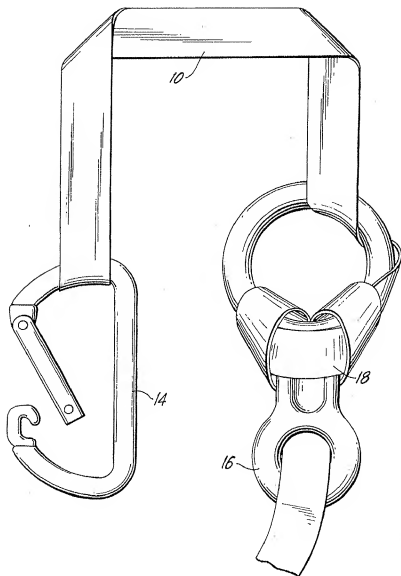


FIG. 2

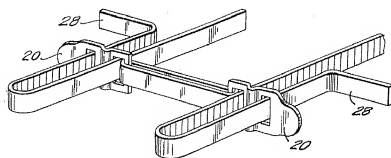


FIG. 3

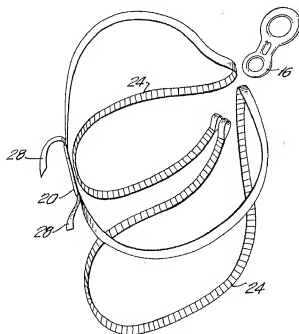


FIG. 3A

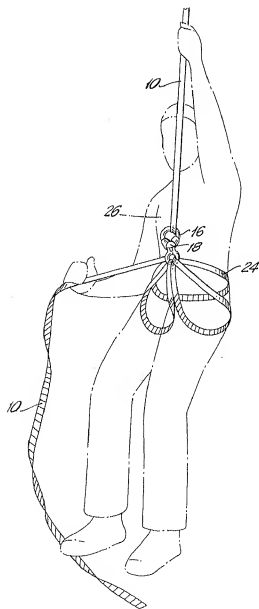


FIG. 4

SAFETY LOWERING DEVICE

FIELD OF INVENTION

This invention relates to a lowering device, specifically one for moving a person or object from one height to a lower one.

DISCUSSION OF PRIOR ART

Heretofore, lowering devices used in prior applications for getting people out of high-rise buildings, specifically down the outside of the building. These lowering devices were restricted to one or more locations that could not readily be moved. Lowering methods by these devices were restricted to short distances due to the bulky equipment required.

All of these devices used took too much space and were an eyesore to the building.

OBJECTS

Accordingly, several advantages of my invention are: lower cost, reduced weight, reduced size, additional safety, and greater speed of use.

The cost of this invention is relatively inexpensive compared to prior art or other methods used to escape from high-rise buildings.

The weight of the preferred embodiment of my invention is just 6 pounds and I know of nothing on the market that will accomplish equivalent results for this weight.

The size of the preferred embodiment is 15 inches in diameter and 2 inches thick. It will extend down the side of a building 300 feet, or 30 stories (assuming the building has 10 foot stories). A larger unit could be made for use in higher buildings, but would, of course, be of a larger size.

My invention is strong enough to support any overweight person safely. The adjustable supporting seat is of the cinching type that one cannot fall out of if properly installed.

Its speed of use is controlled by the user. One can get out of a building to the ground quicker than any method used today including stairs, elevator, or fire escapes. Its use is thus invaluable.

Further objects and advantages of my invention will become apparent from a consideration of the drawings and ensuing description thereof.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a perspective view of a life line reel.

FIG. 2 is a perspective of a Figure "8" ring, friction knot, and carabiner used in the invention.

FIG. 3 is a perspective view of a supporting seat used in the invention.

FIG. 3A is a perspective view of the harness and 35 buckles assembly of this invention.

FIG. 4 illustrates my invention in operation.

DESCRIPTION

My invention comprises (FIG. 1) a reel 22 of nylon webbing used as a life line. The reel consists of two 1/4 inch circular pieces of 0.080" windo-type plastic with a 1/2 inch hole drilled in the centers. At the center of the reel, a 2 inch piece of 1/2 inch aluminum rod 12 is inserted. The plastic sides of the reel are held on to the 65 aluminum rod by two pieces of plastic tubing 8, each measuring 1/2 inch I.D. by 1/2 inch long and 1/16 inch wall thickness, preferable made of polyethylene plastic tub-

ing. They are force fit over ends of the aluminum rod. A reel of one-inch nylon webbing, Mil-W-17337D is wound around the reel.

Life line 10 is of nylon webbing attached to the reel's center rod 12 by folding over and sewing a 6 inch seam. The aluminum rod has a 1/16 inch hole drilled in it and nylon thread is sewed through the hole into the nylon line to prevent the rod from falling out. The line is then wound onto the reel 22.

The other end of the line 10 has a 12 inch lap with 6 inches of it sewed and attached to a carabiner 14 (FIG. 2) such as a "Chouinard Light D" manufactured by Great Pacific Iron Works, P.O. Box 150, Ventura, Calif. 93002.

Spaced back from the carabiner 14 and of the line 10 by about 25 inches is a figure "8" ring 16 and friction knot 18 as shown in FIG. 2. Ring 16 is manufactured by Colorado Mountain Industries Corporation, P.O. Box 535, Franklin, W.Va. 26807.

Referring to (FIG. 3), attached to the small circle of the ring 16 is an adjustable supporting seat 24 made of one-inch nylon webbing.

The adjusters on supporting seat 24 are non-slip buckles 20 preferable Model BN-2222, manufactured by EON Corporation, 2425 San Fernando Road, Los Angeles, Calif. 90065. The lap over seams on the supporting seat attachment to ring 16 are 6 inches long with 3 inch seam sewed thereon. The lap over seam between the non-slip buckles 20 also have 3-inch sewed seams.

OPERATION

The operating parts of my invention are reel 22, life line 10, carabiner 14, figure "8" ring 16, supporting seat 24, and non-slip buckles 20.

The reel serves two purposes: (1) it is used for compact line storage, and (2) the center of the reel on which the line is wound serves as a safety stop at the end of the line.

The line, when unrolled down the side of a building, provides a means for a person to travel down that line to the ground at a safe speed.

Carabiner 14 is a fastening device which will quickly fasten the line to a supporting structure.

Figure "8" ring 16 is used to regulate one's descent down the life line 10 and is the supporting structure for the supporting seat 24.

The supporting seat with adjusting non-slip buckles 20 is used to support a person or object.

Assume that a person 26 is in a high-rise hotel and a fire occurs and person has no regular means of escape via stairs or elevator. As shown in (FIG. 4) the person would then open a window and look down to see that there is no fire below. The person would then follow the following instructions: (1) Open up the Safety Lowering Device. (2) Lay out supporting seat 24 on floor and stand in it as marked. (3) Pull it up to hip level, then pull up on waist band with non-slip buckles 20 to waist and pull on waist lines 28, adjusting to fit snugly. (4) Pull on line 10 with carabiner 14 and until you have enough line to wrap around a bed and hook back on line with carabiner. (5) Push bed over to wall where window is located. (6) Throw reel 22 out the window so it can unreeel to ground. (7) Place a pillow on window sill where line 10 goes over. Climb out window with line tight to bed. (8) Regulate your descent down line with light pressure on line where it enters ring 16.

The Safety Lowering Device is packaged in heavy clear plastic with picture diagrams of operation in plain view.

While the above description contains many specifics, these should not be construed as limitations on the scope of the invention, but rather as an exemplification of one preferred embodiment thereof. Many other variations are possible, for example, this Safety Lowering Device may be used for lowering objects of any size within weight restrictions to the ground. Descent is regulated by operator on ground at the other end of the line.

Mountain climbers, fireman, steelworkers, construction workers, or anyone wanting to lower themselves or an object from one height to a lower height can use this device.

This Safety Lowering Device can be used horizontally to keep objects spaced apart by the use of light pressure from an operator.

Accordingly, the scope of this invention should be determined not by the embodiment illustrated, but by the appended claims and their legal equivalents.

I claim:

1. A self-contained safety device for self-lowering a person, comprising
 - (a) an elongated high-strength safety webbing of sufficient strength to safely support the person;
 - (b) a reel housing said webbing which is adapted to be released from said reel;
 - (c) a generally figure 8 shaped member having first and second adjacent apertures in a common plane;
 - (d) a seat for secure engagement of said person, said seat comprising a non-slip buckle means and two elongated high-strength seat webbings each of said

seat webbings being looped to form first a leg hole and one-half of waist hole, one-end of each seat webbing being secured by passing through said second aperture of said generally figure 8 shaped member, with an intermediate portion thereof, being folded back upon itself forming said leg hole and one-half of said waist hole, and the opposite end of each seat webbing being connected through said non-slip buckle means;

- (e) a friction knot formed by passing said safety webbing through said second aperture and then through said first aperture of said generally figure 8 shaped member and about the wall of said first aperture, said friction knot being formed from said safety webbing and being manipulatable to extend said webbing at a controlled rate, and
- (f) means at the free end of said safety webbing for anchoring said safety webbing when the person is being lowered.

2. The device of claim 1 wherein said webbing is made of a flat piece of nylon webbing.

3. The device of claim 1 wherein said anchoring means is a carabiner.

4. The device of claim 1 further including a safety stop which prevents said person from coming off said webbing when reaching the end thereof.

5. The device of claim 1 wherein said webbing is fed through said generally figure 8 shaped member about said apertures thereby guiding said webbing.

6. A safety device as in claim 1 wherein said non-slip buckle means comprises two non-slip buckles joined together by webbing with each of said seat webbing extending through one of said non-slip buckles.

• • • • •



US006059266A

United States Patent [19]

Ascherin et al.

[11] Patent Number: **6,059,266**[45] Date of Patent: ***May 9, 2000**[54] **RECOVERY DEVICE**

[76] Inventors: **Terry C. Ascherin**, 8208 Jayssel St.,
Sunland, Calif. 91040; **Russ Anderson**,
324 Foothill Ave., Sierra Madre, Calif.
91024

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[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **09/064,024**[22] Filed: **Apr. 21, 1998****Related U.S. Application Data**

[63] Continuation-in-part of application No. 08/717,753, Sep. 23,
1996, Pat. No. 5,762,297.

[51] Int. Cl.⁷ **B66D 1/36**[52] U.S. Cl. **254/334; 254/326; 254/380;**
..... **242/397.5**

[58] Field of Search **254/323, 325,**
..... **254/326, 334, 335, 380; 242/397, 397.5,**
..... **398, 403; 280/477**

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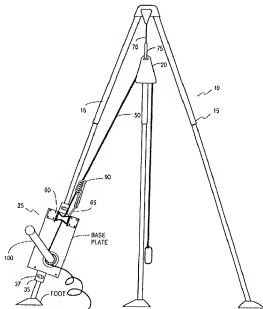
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Primary Examiner—Donald P. Walsh
Assistant Examiner—Emmanuel M. Marcelo
Attorney, Agent, or Firm—Blackley, Sokoloff, Taylor &
Zafman, LLP

[57]

ABSTRACT

A recovery device particularly useful in confined space and remote rescues. The recovery device includes a base plate, a winch coupled to the base plate, and an anchoring plate coupled to the base plate to detachably couple the base plate to an object that will support the recovery. A cord is attached to the winch to raise or lower the load to or from the recovery device or object. A guide roller assembly is coupled to the base plate to guide the cord and reduce the amount of friction on the cord that occurs when raising a load with the winch.

13 Claims, 15 Drawing Sheets

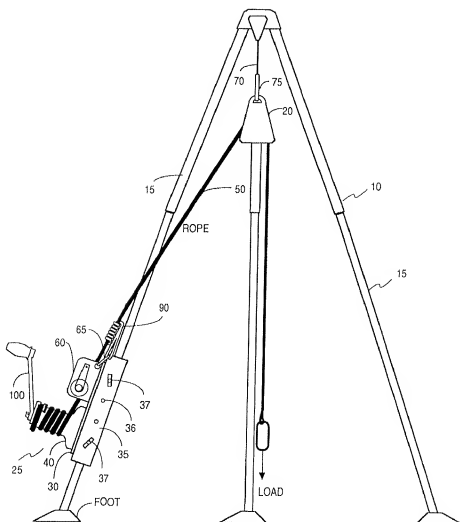
**Fig. 1a**

Fig. 1b

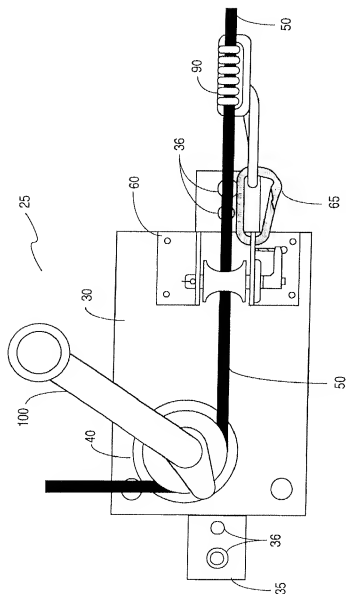


Fig. 2a

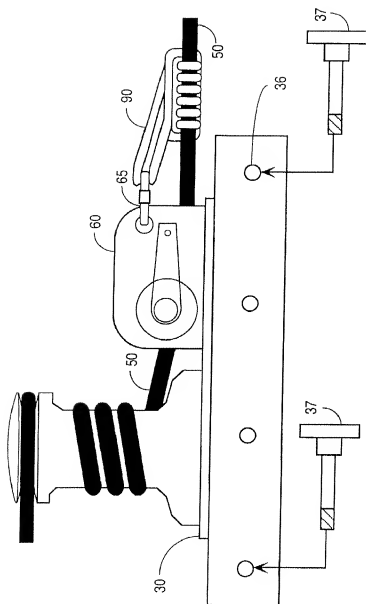
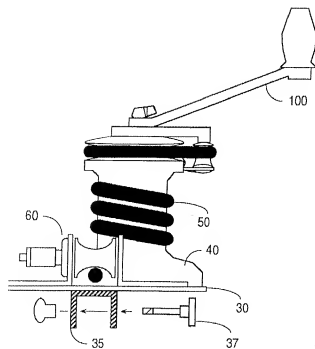
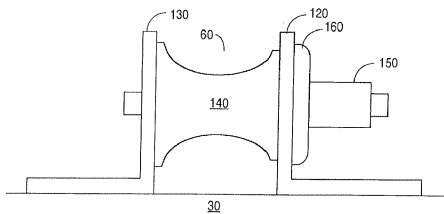
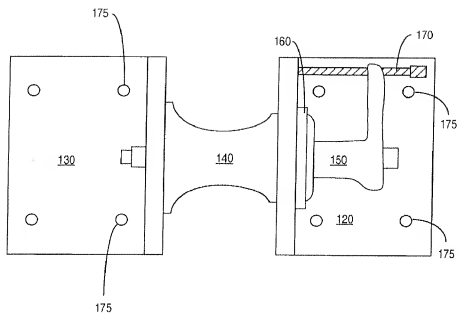
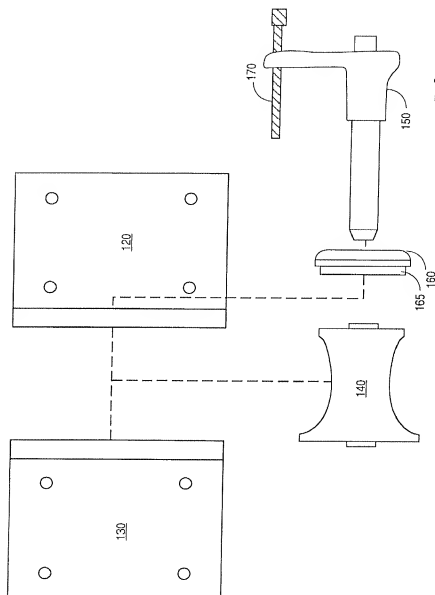
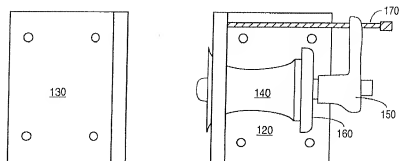
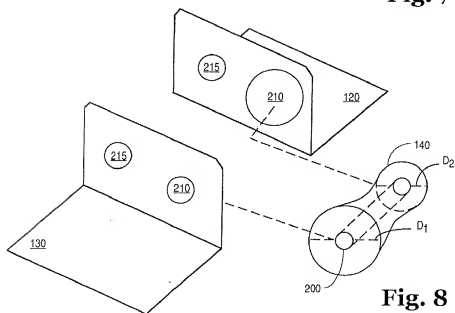


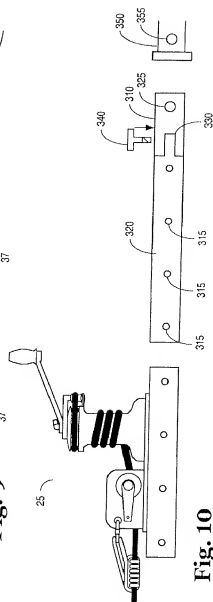
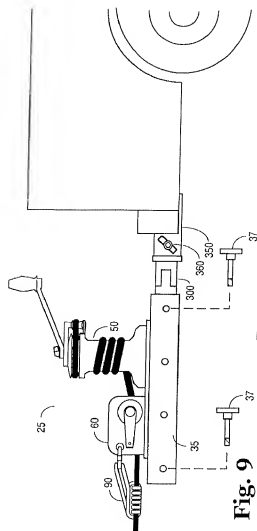
Fig. 2b

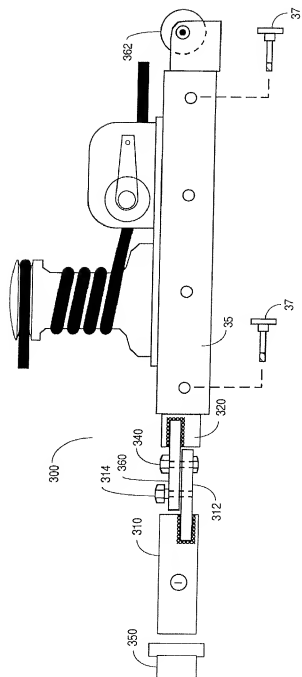
**Fig. 3****Fig. 4**

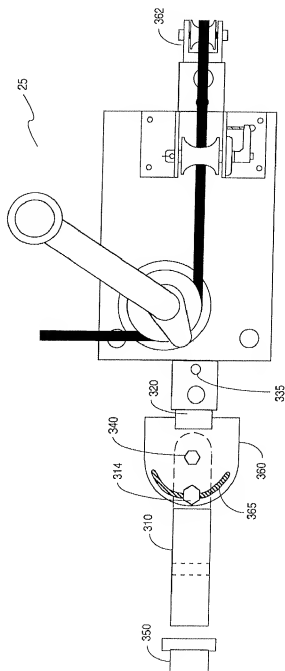
**Fig. 5**

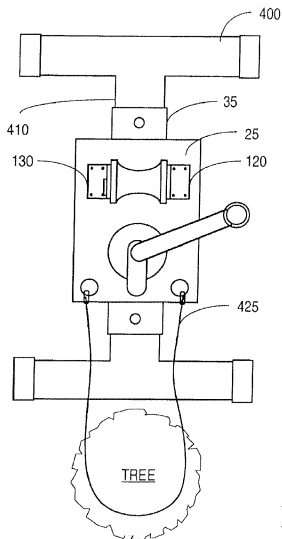


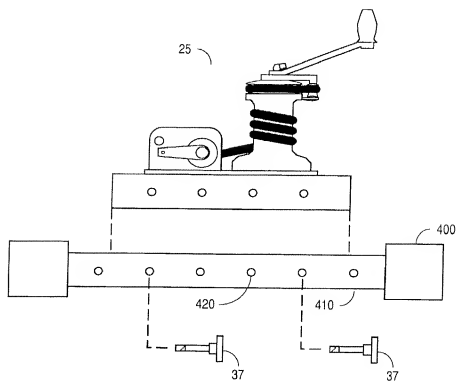
**Fig. 7****Fig. 8**

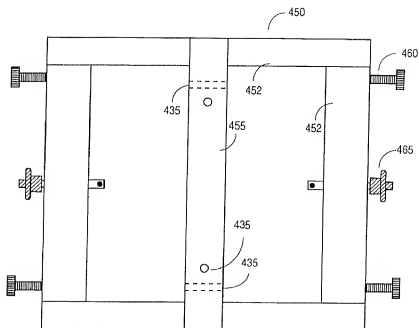
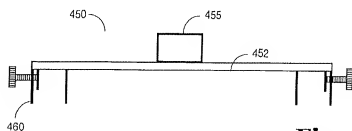


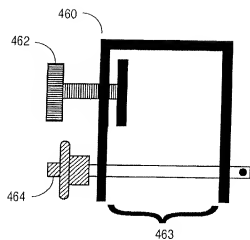
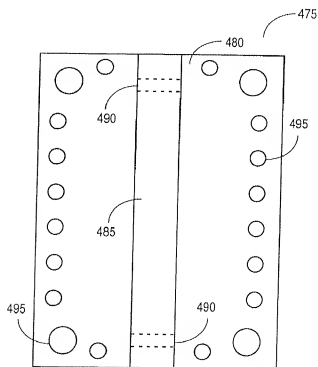
**Fig. 11a**

**Fig. 11b**

**Fig. 12a**

**Fig. 12b**

**Fig. 13a****Fig. 13b**

**Fig. 13c****Fig. 14**

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RECOVERY DEVICE

RELATED APPLICATION

The application is a continuation-in-part of application Ser. No. 08/717,753 filing date Sep. 23, 1996 U.S. Pat. No. 5,762,297 titled Recovery Device for Use in an Airborne Vehicle.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates generally to the movement of loads and more particularly, to devices and systems for accomplishing the movement of loads.

2. Background Information

A winch provides a stationary hoisting machine from which a load may be raised or lowered by wrapping a cord or rope around a drum. Such devices are commonly used in rescue operations. However, such devices generally require a great deal of area to set up and maneuver the winch assembly and considerable time to set the system up for proper operation. There is need for a device for raising or lowering a load that may be used in a confined area and may be assembled and put in place in short order.

SUMMARY OF THE INVENTION

The invention relates to a recovery device particularly useful in confined space and remote rescues. The recovery device includes a base plate, a winch coupled to the base plate, and an anchoring plate coupled to the base plate to detachably couple the base plate to an object that will support the recovery. A cord is attached to the winch to raise or lower the load to or from the recovery device or object. A guide roller assembly is coupled to the base plate to guide the cord and reduce the amount of friction on the cord that occurs when raising a load with the winch.

The recovery device is particularly useful with a confined space derrick load management system such as, for example, a tripod (three leg) or quadpod (4 leg) system. The recovery device may be quickly and easily secured or coupled directly to a leg of the tripod to reduce the amount of area or space needed to complete the recovery. The recovery device may also be coupled to a vehicle trailer hitch receiver. In this manner, in remote areas or inadequate work space environments, the recovery device can be coupled to a vehicle to support the recovery.

The recovery device may also be coupled to a support object resembling a letter "H." In this manner, the device can be quickly transported to remote off-road or into back-country environments for recovery support.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a view of a tripod load management system illustrating a side view of the installation of the recovery device of the invention.

FIG. 1B is a tripod load management system illustrating a front view of the installation of the recovery device of the invention.

FIG. 2A is a planar top view of an embodiment of the recovery device of the invention.

FIG. 2B is a planar side view of an embodiment of the recovery device of the invention.

FIG. 3 is a planar side view of a manually-operated winch attached to the recovery device of the invention.

FIG. 4 is a planar side view of the guide roller assembly portion of the recovery device of the invention.

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FIG. 5 is a planar top view of the guide roller assembly portion of the recovery device of the invention.

FIG. 6 is an exploded planar top view of the guide roller assembly portion of the recovery device of the invention.

FIG. 7 is a planar top view of the guide roller assembly portion of the recovery device of the invention, wherein the roller portion has been removed from between opposing L-shaped angle supports.

FIG. 8 is a perspective side view of a pair of opposing L-shaped angle supports of the guide roller assembly portion of the recovery device of the invention.

FIG. 9 is a planar side view of a second embodiment of the invention showing an embodiment of the recovery device of the invention coupled to a first embodiment of a vehicle trailer hitch receiver.

FIG. 10 is an exploded planar side view of an embodiment of the recovery device of the invention coupled to a first embodiment of a trailer hitch sleeve which in turn is coupled to a vehicle trailer hitch receiver.

FIG. 11a is a side view of an embodiment of the recovery device of the invention coupled to a second embodiment of a trailer hitch receiver.

FIG. 11b is a top view of an embodiment of the recovery device of the invention coupled to a second embodiment of a trailer hitch receiver.

FIG. 12a is a planar top view of a third embodiment of the invention showing an assembly including an embodiment of the recovery device of the invention coupled to an H-support and the assembly coupled to a tree.

FIG. 12b is a planar side view of a portion of the assembly of FIG. 12a.

FIG. 13a is a top view of a ladder mount receiver for adapting an embodiment of the recovery device of the invention to a ladder.

FIG. 13b is a side view of a ladder mount receiver for adapting an embodiment of the recovery device of the invention to a ladder.

FIG. 13c is a side view of a U-shaped adapter mount of a ladder mount receiver that is configured to couple a ladder mount receiver to a ladder.

FIG. 14 is a top view of a universal receiver plate for attaching an embodiment of the recovery device of the invention to a load-bearing object.

DETAILED DESCRIPTION OF THE INVENTION

FIGS. 1a and 1b illustrate the recovery device of the invention as it would be used in a tripod load management system. FIGS. 1a and 1b present different views of tripod 10. Tripod 10 includes three legs 15 extending outwardly from an apex of tripod 10. Attached to the apex is pulley 20, such as a Prusick-minding pulley. Prusick-minding pulleys are well-known to persons of ordinary skill in the mountaineering and life-saving disciplines. Prusick-minding pulley 20 is attached to web loop or hard point 70 at the base of the apex of tripod 10. Prusick-minding pulley 20 is preferably attached to web loop or hard point 70 by a carabiner 75, the carabiner 75 allowing a quick and easily installed, detachable connection to web loop or hard point 70.

Recovery device 25 of the invention is detachably coupled to one leg 15 of tripod 10. Recovery device 25 includes a manually operated winch 40 with which handle 100. Wrapped around winch 40 is cord 50 that is, for example, a nylon or dacron rope capable of supporting a

10,000 pound load without breaking. A standard one-half inch static, kernmantle rope used throughout the Fire Rescue, and Urban Search and Rescue communities is suitable. Cord 50 extends through guide roller assembly 60 that is attached to recovery device 25. Guide roller assembly 60 serves to guide cord 50 onto the bottom edge of the hub of winch 40. Guide roller assembly 60 also reduces the amount of friction on cord 50 that occurs when raising a load with winch 40. Cord 50 extends through pulley 20 attached to the apex of tripod 10. Cord 50 may then be attached to a load to raise or lower the load to or from tripod 10, respectively.

The system shown in FIGS. 1a and 1b further includes a second cord 90 tied at one end in the form of a Prussick knot. The Prussick knot of second cord 90 is connected to cord 50 as the cord extends from guide roller assembly 60 towards pulley 20. The other end of second cord 90 is tied or coupled to guide roller assembly 60, for example, by a carabiner. Prussick knot 90 provides a safety device to keep a load from falling if there is a malfunction or a catastrophic failure of winch 40 or of any part of recovery device 25. Prussick knots are well-known in the art of mountaineering, and, in this system, serve to grip or clamp down on cord 50 in the event of a malfunction on the winch side of pulley 20. The Prussick knot system also allows cord 50 to be exchanged under load conditions by clamping down on cord 50 when the direction of cord 50 is reversed (i.e., when the force applied on the winch side of pulley 20 is released).

FIGS. 1a and 1b illustrate the use of the recovery device in a system that may quickly and easily be installed to a leg 15 of tripod 10. In one embodiment, the recovery device is designed to be fastened to holes provided in leg 15 of tripod 10. In general, tripod 10 will have at least a two-leg system for each leg, each part of the leg system having a number of equally spaced holes on each leg. The holes designed to adjust the length of each leg by mating holes on different parts of the leg system with a pin or bolt. Unused or available holes on either part of the leg system of each leg are available for use by recovery device 25.

In one embodiment, recovery device 25 includes U-shaped mating member 35 coupled to the bottom side portion of base plate 30. U-shaped mating member 35 is coupled to base plate 30 to form a groove to accommodate one leg 15 of tripod 10. U-shaped mating member 35 also includes, in this embodiment, a number of holes corresponding to the spacing of holes of similar diameter on leg 15. Once recovery device 25 is placed on tripod 10 with leg 15 accommodated in U-shaped mating member 35 and at least one hole of leg 15 is aligned with one hole of U-shaped mating member 35, a pin or anchor bolt is inserted and secured through the aligned holes to couple recovery device 25 to tripod 10. In the embodiment shown in FIG. 1a, holes 36 are placed in adjacent walls of U-shaped mating member 35 and securing pin or bolt 37 is placed through one wall of U-shaped mating member 35, through leg 15 and tripod 10, and through a second wall of U-shaped mating member 35 and secured. In the embodiment shown in FIG. 1b, U-shaped mating member 35 extends beyond the length of base plate 30. Holes are placed in the base of U-shaped mating member 35, particularly on the portions of U-shaped mating member 35 extending from either end of base plate 30. It is to be appreciated that the holes in the base of U-shaped mating member 35 may be in addition to the holes in the walls of U-shaped mating member 35 (FIG. 1b). Securing pin or bolt 37 is placed through the base of U-shaped mating member 35 and through leg 15 and secured.

FIGS. 2a and 2b illustrate different views of recovery device 25 of the invention. Recovery device 25 includes

winch 40 coupled to base plate 30. Winch 40 is preferably a manually-operated winch as shown in FIG. 2a, but could also be a motorized winch, such as, for example, an electrically-operated winch. In one embodiment, for example, recovery device 25 may be supplied with a chuck to adapt a commercial electric drill motor to the top of winch 40 to electrically power (rotate) winch 40. Winch 40 includes a winch handle 100 that is, in one embodiment, detachably coupled to device 25 and may be placed on top of winch 40 to rotate winch 40 in a circular fashion to raise or lower load. Handle 100 may also be detachably coupled to base plate 30 for storing or carrying purposes so that handle 100 does not protrude from device 25. In operation, handle 100 is installed on top of winch 40.

Base plate 30 has an area large enough to accommodate winch 40, guide roller assembly 60, and U-shaped mating member 35. Addressing these concerns, base plate 30 and recovery device 25 is preferably of a compact size so as to be easily maneuverable about a job site.

Recovery device 25 includes a guide roller assembly 60 to guide cord 50 between winch 40 and the load and to reduce the amount of friction on cord 50 that occurs when raising a load with winch 40. In this embodiment, guide roller assembly 60 is located on the load side of recovery device 25.

At least one Prussick knot 90 is attached to cord 50, primarily as a safety device in the event of a malfunction in the winch side of the pulley. The use of Prussick knot 90 also allows cord 50 to be exchanged under load conditions as explained below. In the embodiment shown in FIGS. 2a and 2b, Prussick knot 90 is coupled to guide roller assembly 60 by carabiner 65, thus making Prussick knot 90 easily detachable.

FIGS. 2a and 2b show different views of an embodiment of U-shaped mating member 35 coupled to base plate 30. In this embodiment, U-shaped mating member 35 includes holes 36 on its base and its side walls for anchoring recovery device 25 to, for example, leg 15 of tripod 10. It is to be appreciated that each hole in U-shaped mating member 35 need not be utilized to anchor recovery device 25 to tripod 10. Instead, one skilled in the art will recognize the minimum number utilized, with securing bolts or pins, to anchor recovery device 25. In FIG. 1a, for example, two holes in U-shaped mating member 35 have securing bolts or pins inserted through the holes.

FIG. 3 illustrates a portion of recovery device 25 of the invention. The portion of recovery device 25 shown in FIG. 3 illustrates a planar side view of manually-operated winch 40 with cord 50 wrapped around winch 40 and extending through guide roller assembly 60. FIG. 3 also illustrates an embodiment of U-shaped mating member 35 coupled at its base to base plate 30. Holes are placed in the walls of U-shaped mating member 35 to allow the placement of bolt or pin 37 through one wall, through, for example, a hole in tripod leg 15, and through a hole in the second wall.

The following example sets forth the steps for attaching and operating recovery device 25 with a tripod load management system. First, the tripod system is set up as directed by the manufacturer over the job site, such as, for example, a confined space hole. The tripod is generally equipped with an anchoring system to anchor the tripod to the ground. Next, the most advantageous position of recovery device 25 is determined based on work area demands. To install recovery device 25 on a leg of tripod 10, winch 25 is placed on leg 15 with guide roller assembly 60 pointed toward the apex of tripod 10. Recovery device 25 is mounted by

accommodating leg 15 of tripod 10 in U-shaped mating member 35 and aligning, in this example, at least two holes for anchor bolts. Next, a cord is placed through pulley 20 and pulley 20 is attached to web loop or hard point 70 at the apex of tripod 10 by carabiner 75. The cord is lowered to its desired length, placed through guide roller assembly 60, and wrapped with four coils of rope around winch 40 in a clockwise rotation. The rope is continually wrapped around winch 40 into a self-tailing groove. The self-tailing groove will manage the tension on the rope without an operator's constant hand pressure and supervision. A second rope 90 with Prussick knot is attached to rope 50 on the load side of guide roller assembly 60 and attached to guide roller assembly 60. The system is now ready to raise or lower a load.

FIGS. 4-8 illustrate guide roller assembly 60 of the invention. FIG. 4 illustrates a planar side view of guide roller assembly 60 coupled to recovery device 25. FIG. 5 illustrates the planar top view of guide roller assembly 60. FIG. 6 illustrates an exploded planar top view of guide roller assembly 60. FIG. 7 illustrates a planar top view of guide roller assembly 60 in an open position to load a cord. FIG. 8 illustrates L-shaped angle supports 120 and 130 and roller 140 of guide roller assembly 60.

As noted above, guide roller assembly 60 includes a pair of L-shaped angle supports 120 and 130 and roller 140 between the pair of angle supports. L-shaped angle supports are secured to the base plate 30 of recovery device 25 through bolts or similar fasteners at openings 175. Roller 140 is preferably made of aluminum and has a substantially cylindrical shape with concave sides and an axial hole 200 extending through its length (see FIG. 8). At each end, oil-impregnated bronze bushings are located in the axial hole. The diameter of one end of roller 140 is larger than the diameter of the second end of roller 140. (In FIG. 8, D₁ is greater than D₂.) Guide roller assembly 60 further includes a securing rod extended through a hole in L-shaped angle support 120, through axial hole 200, through roller 140, and through L-shaped angle support 130. Securing rod 150 is preferably a ball-locked pin to secure roller 140 between the pair of angle supports 120 and 130, respectively.

Guide roller assembly 60 is designed so that parts will not be lost when recovery device 25 is installed in a recovery or other operation. Thus, as noted, guide roller assembly 60 is designed so that roller 140 has a diameter at one end that is greater than the diameter at the other end (D₁ is greater than D₂). The smaller diameter (D₂) of roller 140 is sized so that it may fit through an opening 210 in L-shaped angle support 120 allowing roller 140 to be moved out of the path of cord 50 so that cord 50 may be put down and roller 140 placed over cord 50 in its appropriate position (see FIGS. 7 and 8). As illustrated in FIG. 7, securing rod 150 is pulled away from L-shaped angle support 130 and toward angle support 120. Roller 140 is also moved toward angle support 120 through opening 210 and out of the path of cord 50. The other end of roller 140 has a diameter D₁ that is larger than the opening 210 in L-shaped angle support 120 so that roller 140 cannot be completely removed through opening 210 in L-shaped angle support 120.

The invention contemplates that securing rod 150 and roller 140 may be slid out of the path of cord 50 to allow cord 50 to be placed under roller 140. Once cord 50 is positioned between the pair of angle supports 120 and 130, roller 140 is positioned over cord 50 and securing rod 150 is inserted into the opposite L-shaped angle support 130 securing guide roller assembly 60. To maintain roller 140 between the pair of L-shaped angle supports 120 and 130, a preferably aluminum flange 160 is positioned between

securing rod 150 and the opening in L-shaped angle support 120. Roller flange 160 has a first exterior diameter that is greater than opening 210 in L-shaped angle support 120 so that roller 140 is secured between L-shaped angle supports 120 and 130 and does not move through opening 210 in L-shaped angle support 120. Roller flange 160 has a flange portion 165 with a second exterior diameter that fits within the opening 210 of L-shaped angle support 120. Flange portion 165 has a width approximately equivalent to the body of L-shaped angle support 120. Through the center of roller flange 160 is an axial hole having a diameter large enough to accommodate securing rod 150.

Guide roller assembly 60 also includes a mechanism to attach securing rod 150 to guide roller assembly 60 so that rod 150 is not lost during assembly of the recovery device. Preferably, the mechanism is a small diameter cable 170 coupled to rod 150 and L-shaped angle support 120. The length of cable 170 is sufficient to allow rod 150 to be removed from the path for cord 50 defined by opposing L-shaped angle supports 120 and 130.

By devising a mechanism whereby a cord may be placed in guide roller assembly 60 by disassembling guide roller assembly 60, placing cord 50, and reassembling guide roller 60, the invention allows the replacement of cord 50 under load conditions. L-shaped angle supports 120 and 130 also include second openings 215 to couple a second cord 90 with a Prussick knot. In this manner, a Prussick knot or knots may be coupled or tied to cord 50 and connected to L-shaped angle supports 120 and 130 via carabiner 65 through opening 215. Thus, under load conditions, tension on the winch side of second cord 90 may be released and the Prussick knot system will clamp onto cord 50 and hold cord 50 and the load at the angle support or supports 120 and 130. Securing rod 150 and guide roller 140 may then be removed from between L-shaped angle supports 120 and 130 and rope 50 removed from guide roller assembly 60. In this manner, a second rope may then be placed and assembled in guide roller assembly 60 and recovery device 25 while the first cord maintains the load. This mechanism allows additional flexibility in maneuvering a load.

FIGS. 9-11D illustrate a second embodiment of the invention wherein an embodiment of recovery device 25 is assembled to a vehicle trailer hitch receiver. In this embodiment, the invention contemplates the additional part of trailer hitch sleeve 300, having a portion 310 shaped to mate with a conventional (generally 2 inch by 2 inch rectangular) trailer hitch receiver 350. In this embodiment, sleeve 350 also includes an arm portion 320 that will accommodate U-shaped mating member 35 of recovery device 25. In one embodiment, arm portion 320 and mating portion 310 are each made of, for example, hollowed, hard aluminum or steel. Mating portion 310 includes an opening 325 that, when inserted in trailer hitch receiver 350, aligns with opening 355 in trailer hitch receiver 350 to allow a securing bolt or pin to be inserted through the body of trailer hitch receiver 350 and the body of mating portion 310 of sleeve 300. Similarly, arm portion 320 of sleeve 300 contains a number of holes 315 through its body portion to align with similar openings in U-shaped mating member 35 of recovery device 25. In this manner, securing bolts or pins may be inserted through holes in, for example, the walls or base of U-shaped mating member 35 and through the body of arm portion 320 of sleeve 300 to secure recovery device 25 in sleeve 300.

Arm portion 320 of sleeve 300 is connected to mating portion 310 by a knuckle joint 330 allowing arm portion 320 to rotate about a vertical axis at knuckle joint 330. In this

manner, the position of trailer hitch receiver 350 and thus, a trailer to which it is attached, need not be directly aligned with the horizontal axis of trailer hitch receiver 350. The articulating joint formed at knuckle 330 allows, for example, rescues to utilize recovery device 25 in areas remote from the vehicle while allowing the vehicle to be placed in a manner close enough to support the rescue operations.

FIGS. 11a and 11b show a second embodiment of a trailer hitch sleeve. In this embodiment, arm portion 320 is coupled at its end to rotation plate 360. Rotation plate 360 is coupled at a point 340 by a securing pin or bolt to receiving plate 312 extending from the end of mating portion 310. Point 340 defines a vertical axis about which rotation plate 360 and arm portion 320 may be rotated in a horizontal plane relative to the vertical axis. Rotation plate 360 has a partially arcuate or semi-circular opening 365 extending through its body about point 340. In this manner, sleeve 300 can be held in a position either corresponding to the horizontal axis of trailer hitch receiver 350 or at an angle different than the horizontal axis of trailer hitch receiver 350 by securing pin, rod, or bolt 314 through opening 365 to receiving plate 312 of mating portion 310. Loosening pin, rod, or bolt 314 allows arm portion 320 to be rotated. Tightening pin, rod, or bolt 314 fixes arm portion 320 at a desired point. Finally, in the embodiment shown in FIGS. 11a and 11b, a second end of arm portion 320 contains second guide roller assembly 362 to facilitate guidance of cord 50.

FIGS. 12a and 12b illustrate a third embodiment of the invention wherein recovery device 25 of the invention is assembled to H-support 400. In one embodiment, H-support 400 is made of, for example, hollowed, hard aluminum or steel with an approximately 2 inch by 2 inch rectangular body. As shown in FIG. 12a, recovery device 25 is coupled to center portion 410 of H-support 400, much in the same way as recovery device 25 was coupled to arm portion 320 in the embodiment described with reference to FIGS. 9-11 and the accompanying text. Center portion 410 of H-support 400 contains a number of holes 420 through its body portion to align with similar openings in U-shaped mating member 35 of recovery device 25. In this manner, securing bolts or pins may be inserted through holes in, for example, the walls or base of U-shaped mating member 35 and through center portion 410 of H-support 400 to secure recovery device 25 to H-support 400. The legs of H-support 400 serve to stabilize the assembly. The assembly is particularly useful in remote off-road or backcountry environments where it can be coupled to a load-bearing object, for example, a tree. The assembly is coupled to a tree by coupling a rope, cord, or wire 425 to recovery device 25 and around the load-bearing object.

FIGS. 13a-13c relate to another embodiment of the invention wherein an embodiment of recovery device 25 is assembled to a ladder. In this embodiment, the invention contemplates the additional part of ladder mount 450. In one embodiment, ladder mount 450 includes opposing rectangular slats 452. Opposing slats 452 form a ladder mount having a width approximately equal to the width of the support members of a ladder. The ladder in this case may be a conventional stand-alone ladder or a ladder configured as part of a rescue vehicle, such as a fire truck. As shown in FIG. 13a, ladder mount 450 attaches to the support members of a ladder through clamping U-joints 460. FIG. 13b is a view of one clamping U-joint 460 having a clamping screw 462 to secure ladder mount 450 to support members of different sizes, e.g., thicknesses. Ladder mount 450 is placed as over the support members of a ladder with a support member mating with opening 463 in U-shaped locking member 460.

Once ladder mount 450 is mated to the support members of a ladder, bolts 462 are tightened to clamp ladder mount 450 to the support members. Once fastened, securing pins 464 are placed through parallel openings in the U-shaped mating member 460 of ladder mount 450 to secure ladder mount 450 to the support members of the ladder.

As shown in FIGS. 13a and 13b, ladder mount 450 also includes a center rectangular member 455 coupled to a pair of opposing slats 452, such as, for example, by a weld. Rectangular member 455 is preferably hollowed steel or hard aluminum. In one embodiment, slats 452 are also made of steel or hard aluminum. Rectangular member 455 includes openings 435 extending through its opposing side walls. In one embodiment, openings 435 are aligned with similar openings in U-shaped mating member 35 of the embodiment of recovery device 25 discussed above, such as, for example, with reference to FIGS. 9-11b and the accompanying text. In this manner, securing bolts or pins may be inserted through holes in, for example, the walls or base of U-shaped mating member 35 and through openings 435 in the top or side of rectangular member 455.

FIG. 14 shows a still further embodiment of the invention where an embodiment of recovery device 25 such as discussed above, is assembled to a universal mounting plate. In this embodiment, universal mounting plate 475 is a plate of steel or hard aluminum 480 with a center rectangular member 485 coupled to the surface of plate 480. Rectangular member 485 contains openings 490 through its side walls to secure mating of U-shaped mating member 35 of recovery device 25 to universal mount 475. Around the perimeter of universal mount 475 are a plurality of openings 495. Openings 495 allow universal mount 475 to be coupled to a load-bearing object, such as, for example, by rope, wire, cord, nails, spikes, bolts, or screws. In this manner, universal mount 475 serves to adapt recovery device 25 and support recovery device 25 in many different environments.

In the preceding detailed description, the invention is described with reference to specific embodiments thereof. For example, several embodiments of mounting structures to adapt, secure, and support recovery device 25 are presented. In addition, a specific embodiment of recovery device 25 is presented. It is evident that various modifications and changes may be made thereto without departing from the broader spirit and scope of the invention as set forth in the claims. The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense. What is claimed is:

1. A recovery device comprising:
 - a base plate;
 - a winch coupled to the base plate;
 - an anchoring device coupled to the base plate to couple the device to a load bearing object; and
 - a guide roller assembly having:
 - a first L-shaped angle support having a side portion with a first hole having a diameter;
 - a second L-shaped angle support having a side portion with a second hole having a diameter wherein the diameter of the second hole is smaller than the diameter of the first hole;
 - a roller between the first and second angle supports, the roller having a substantially cylindrical shape with concave sides and a first end and a second end and an axial hole, and where the diameter of the first end of the roller is smaller than the diameter of the second end of the roller; and

a roller flange having a substantially cylindrical shape and a first end and a second end and an axial hole wherein the diameter of the first end is larger than the diameter of the second end, and wherein the second end is adjacent the first end of the roller and is adapted to be detachably engaged in the first hole of the first L-shaped angle support.

2. The recovery device of claim 1, wherein the load bearing object is one of a derrick load management system, a vehicle trailer hitch receiver, and a ladder.

3. The recovery device of claim 2, wherein the guide roller assembly comprises:

a securing rod detachably interposed to the hole of the roller flange and the first hole of the first L-shaped angle support and the hole of the roller and the second L-shaped angle support to secure the roller to the first and second angle supports.

4. The recovery device of claim 3, wherein the securing rod of the guide roller assembly is a ball lock pin.

5. The recovery device of claim 1, wherein the anchoring device comprises:

a U-shaped mating member having a base and opposing side walls and;

one side wall comprising an opening aligned with a corresponding opening in the other side wall;

a portion of the base coupled to a back side of the base plate.

6. The recovery device of claim 1, wherein the anchoring device is a:

U-shaped mounting member having a pair of opposing side walls and a base coupled to a back side of the base plate, the base plate having a first area, the U-shaped mating member extending beyond the first area of the base plate and having a hole in the base of that portion extending beyond the base plate; and

an anchoring device to couple the recovery device to the load bearing device through the hole in the U-shaped mating member.

7. The recovery device of claim 6, further comprising:

a sleeve detachably coupled to the U-shaped mating member, the sleeve having an end adapted to be coupled to a trailer hitch receiver.

8. The recovery device of claim 7, wherein the sleeve has an arm portion and a mating portion, the arm portion adapted to be coupled to the recovery device and the mating portion adapted to be coupled to the trailer hitch receiver, the mating portion coupled to the arm portion through an articulating joint, the articulating joint configured to permit the rotation of the arm portion about an axis of the mating portion.

9. The recovery device of claim 8, wherein a coupling point of the arm portion and the mating portion define an axis about which the arm portion is adapted to be rotated, the device further comprising a rotation plate coupled to an end of the arm portion, the rotation plate having an opening with a substantially arcuate shape about the axis, the arm portion adapted to be additionally coupled to the mating portion through the opening.

10. The recovery device of claim 1, wherein the anchoring device is an H-support having a pair of legs coupled by a center portion, the pair of legs adapted to rest on a surface and provide lateral support for the device, the center portion coupled to the base plate, and one of the base plate and the anchoring device adapted to be coupled to a load-bearing object.

11. A recovery device comprising:

a base plate;

means coupled to the base plate for raising or lowering a load;

means coupled to the base plate for coupling the device to a load bearing object; and

means coupled to the base plate for guiding a cord between the raising or lowering means and a load, the guide means including a first configuration to guide a cord between the raising or lowering means and an object and a second configuration to release a cord from the guide means with the guide means coupled to the base plate.

12. A guide roller assembly comprising:

a first L-shaped angle support having a base and a side portion with a first hole having a diameter, the base of the first L-shaped angle support being configured to be coupled to a base;

a second L-shaped angle support having a base and a side portion with a second hole having a diameter, wherein the diameter of the second hole is smaller than the diameter of the first hole, the base of the second L-shaped angle support being configured to be coupled to a base plate;

a roller between the first and second angle supports, the roller having a substantially cylindrical shape with concave sides and a first end and a second end and an axial hole, wherein the diameter of the first end of the roller is smaller than the diameter of the second end of the roller;

a roller flange having a substantially cylindrical shape and a first end and a second end and an axial hole, wherein the diameter of the first end is larger than the diameter of the second end, and wherein the second end is adjacent the first end of the roller and is adapted to be detachably engaged in the first hole of the first L-shaped angle support; and

a securing rod detachably interposed to the hole of the roller flange and the first hole of the first L-shaped angle support and the hole of the roller and the second L-shaped angle support to secure the roller to the first and second angle supports.

13. A guide assembly comprising:

means for guiding a cord;

first and second means for supporting the guiding means; means for detaching the guiding means from only one of the first support means and the second support means and leaving the cord free of the guiding means.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,059,266
DATED : May 9, 2000
INVENTOR(S) : Ascherin et al.

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Item [56] References Cited, U.S. Patent Document, please insert the following:

-- 2,282,305	5/1942	Bruno . --.
-- 2,734,705	2/1956	Robertson . --.
-- 2,953,330	9/1960	Lysak . --.
-- 2,977,079	3/1961	Calandra . --.
-- 3,088,608	5/1963	Theodore . --.
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-- 4,500,056	2/1985	Della-Moretta . --.
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-- 5,494,240	2/1996	Waugh . --.
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Signed and Sealed this

Thirteenth Day of November, 2001

Attest:

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A5A A44

F2X X8C

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(56) Documents cited

None

(58) Field of search

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INT CL⁴ A62B, A63B, B66D, F16G

(54) Device and method for remotely lowering a load suspended by ropes

(57) A device and method is described for remotely lowering a load using ropes. The load can be an incapacitated climber 11. A first rope 1 is hung over a fixed point such as a branch 2 and one end 4 is tied to the load by for instance the harness 3. A second rope 6 is attached at one end to the load and at the other end using a slip knot 9 such as a prussik knot to the first rope 1. The knot 9 tightens to grip the first rope 1 under the weight of the load 11. A sleeve 12 with attached lowering rope 13 allows for a remote operator to apply pressure to the knot 9 and lower the load 11.

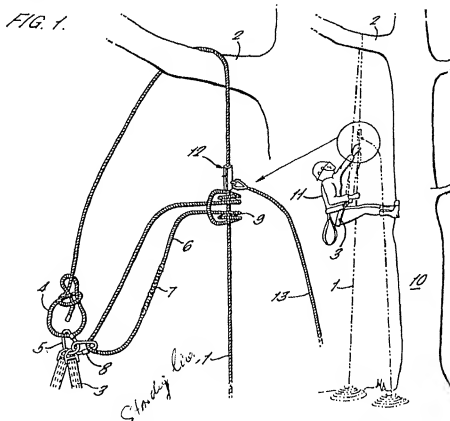
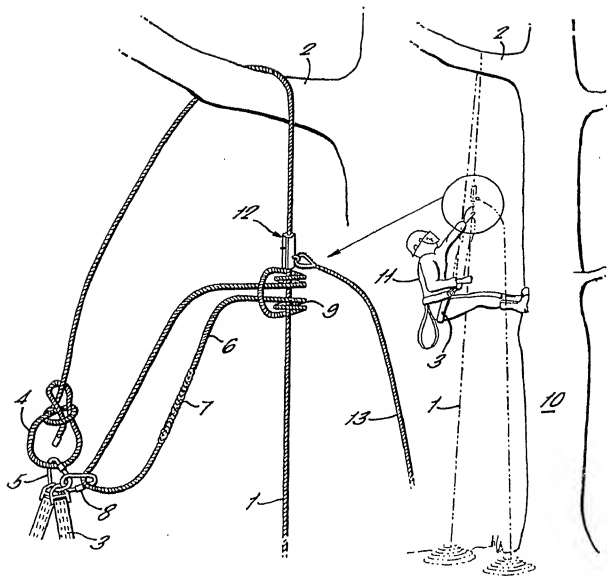
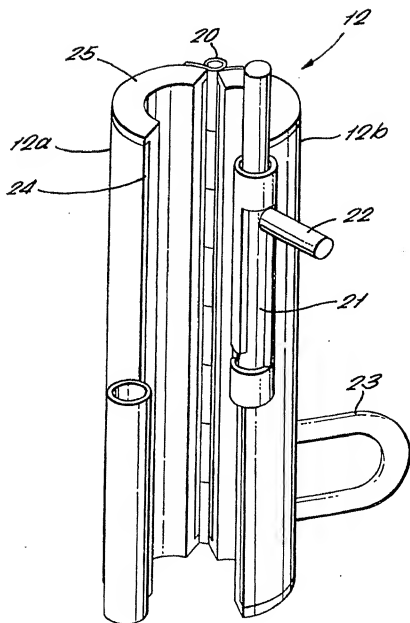


FIG. 1.



2/2

FIG. 2.



DEVICE AND METHOD FOR REMOTELY LOWERING
A LOAD SUSPENDED BY ROPES

This invention generally relates to a method and device for remotely lowering a load suspended by ropes, and in particular to the application of such a device and method to rescuing an incapacitated climber.

It is a requirement that when loads are lowered by ropes, then this should be done as safely as possible. The provision of some means that locks the load in position when the ropes are released is highly desirable to prevent the load rapidly descending and causing injury.

There is also a known problem for climbers that when the climber becomes incapacitated for some reason, it is not possible for rescuers to lower the incapacitated climber without having to climb up to reach him.

The present invention provides a device for remotely lowering a load suspended by a first rope hung over a lowering point, said first rope being attached to said load at one end thereof, and a second rope attached to said load and to said first rope, said first and second ropes forming a loop around said lowering point and said second rope being attached to said first rope by a slip knot which tightens to grip said first rope under the weight of said load; said device comprising engagement means to engage an upper portion of said slip knot from a remote position and to apply a downward pressure to controllably release said grip.

The present invention also provides a method for remotely lowering a load comprising the steps of hanging a first rope over a lowering point and attaching one end

thereof to said load; attaching a second rope to said load and said first rope such that said first and second ropes form a loop around said lowering point, and said second rope grips said first rope by the action of a slip knot which tightens under the weight of said load; and remotely applying a downward pressure on an upper portion of said slip knot to controllably release said grip.

The present invention further provides a method for remotely lowering a load suspended by a first rope hung over a lowering point, said first rope being attached to said load one end thereof, and a second rope attached to said load and to said first rope, said first and second ropes forming a loop around said lowering point and said second rope being attached to said first rope by a slip knot which tightens to grip said first rope under the weight of said load; said method comprising the step of applying a downward pressure to an upper portion of said slip knot to controllably release said grip.

In one aspect of the present invention said load is an incapacitated climber.

The present invention also provides climbing apparatus comprising a first rope to be hung over an object to be climbed and attached to a climber at one end thereof; a second rope for attachment to said climber and said first rope, such that said first and second ropes form a loop around said object and said second rope grips said first rope by the action of a slip knot which tightens under the weight of said climber; and a rescue device for lowering an incapacitated climber comprising means to engage an upper portion of said slip knot from a remote position and to apply a downward pressure to controllably release said grip.

Preferably said engagement means comprises a loop portion for looping around said first rope to engage with

said upper portion of said slip knot and a lowering rope attached to said loop portion, wherein said downward pressure can be applied by an operator or rescuer using said lowering rope.

Preferably said loop portion comprises a sleeve and comprises two parts for engagement around said first rope. In a preferred arrangement said two parts are longitudinally hinged at one side with longitudinal lock means at an opposite side.

Thus the present invention provides a device and method for remotely applying pressure to a knot which is holding a load such as an incapacitated climber in a suspended position. The engagement means applying a downward pressure on the knot overcomes friction which maintains the load in its equilibrium position. When the applied downward pressure is released, friction once again allows the knot to grip the rope and the descent of the load will stop. Clearly therefore the careful application of pressure on the knot can control the rate of descent of the load. Thus a person standing in a remote position such as on the ground can use for instance a rope to apply the downward pressure and thus control the descent of the load.

Examples of the present invention will now be described with reference to the drawings, in which:-

Figure 1 illustrates the rope arrangement applied to lowering an incapacitated climber according to one embodiment of the invention;

Figure 2 illustrates a sleeve used to apply a downward pressure on the slip knot according to one embodiment of the present invention;

Referring now to the drawings, Figure 1 illustrates a rope arrangement illustrated as used for climbing a tree 10 by a climber 11. A first rope 1 is hung over a fixed

point of an object which in this example is the branch 2 of the tree 10. One end 4 of the rope is tied using a convenient knot such as a bowline to a karabiner 5 attached to the harness 3 of the climber 11. A second rope 6 is provided as a loop formed by two ends of the rope 6 being spliced together at splice 7. One end of the looped second rope 6 is attached to a second karabiner 8 which is attached to the harness 3 of the climber 11, and the other end of the looped second rope 6 forms a slip knot 9 around the first rope 1. Typically the slip knot 9 is a prussik knot. This type of knot grips the first rope 1 when the second rope 6 has a load applied thereto. Thus when a climber is suspended in the harness 3, the loop of rope formed by the first and second ropes suspend the climber. The climber can climb up the tree 10 by releasing some of the pressure on the second rope 6 enabling the prussik knot 9 to be slid up the first rope 1. This can be done by using one hand to pull on the first rope 1 whilst sliding the prussik knot 9 up with the other hand. To descend, the climber can simply apply a pressure to the upper portion of the prussik knot 9 to release the grip of this knot on the first rope. In this manner a climber is able to ascend and descend an object to be climbed such as a tree 10 in a simple and safe manner.

However, if the climber should become in any way incapacitated and unable to apply the required downward pressure on the prussik knot 9, then the climber will remain suspended. Thus previously it has not been possible to rescue such an incapacitated climber without ascending in some manner.

In the illustrated embodiment of the present invention a sleeve 12 is provided around the first rope 1 at a position above the prussik knot 9. This sleeve 12 is

free to slide along the first rope 1. Attached to the sleeve 12 is a lowering rope 13 which hangs to the ground. During normal operation of the climbing ropes the sleeve 12 and lowering rope 13 are not utilised. Only if the climber 11 becomes incapacitated in some way then these are used. If a climber is incapacitated by for instance an electric shock then a potential rescuer can pull on the lowering rope 13 to apply a downward pressure on the prussik knot 9 to overcome friction between the first and second ropes 1 and 6. By careful application of pressure on the prussik knot 9, a potential rescuer can control the rate of descent of the incapacitated climber.

Although the example described hereinabove has been concerned with lowering an incapacitated climber, the arrangement shown in Figure 1 can be used for lowering any load to ground. All that is needed is for the first and second ropes 1 and 6 to be arranged in the shown configuration and the load to be hung from the harness 3 or some other suitable means. This would then allow an operator to utilise the lowering rope 13 to control the rate of descent of the load. If for any reason the operator should let go of the rope, then the prussik knot 9 will regrip the first rope 1 and the load will descend no further. Clearly this is a safer arrangement for lowering a load than used conventionally, since in previous arrangements if an operator releases the rope which he is using to lower the load, then the load will descend freely under the action of gravity in a dangerous manner.

There are many ways in which the required pressure could be applied to an upper portion of the prussik knot 9. In a simple arrangement a loop could be provided at the end of the rope 13 through which the first rope 1 is threaded. However, this does not allow the lowering rope 13 to be easily detached from the first rope 1. In this

arrangement it would require the whole length of the first rope 1 to be unthreaded through such a loop. To allow easy engagement and disengagement of a means to apply the required downward pressure, a sleeve 12 is preferably formed of two halves longitudinally separated. Figure 2 illustrates such a sleeve which has a longitudinal hinge 20 allowing a first and second portion 12a and 12b of the sleeve to be hingely engaged around the first rope 1. The sleeve 12 is also provided with a longitudinal lock means comprising a longitudinally engageable bolt 21 which can be actuated by the bolt handle 22. The bolt 21 is provided on the opposite side of the sleeve 12 to the longitudinal hinge 20 and allows for the sleeve 12 to be locked in an engaging position around the first rope 1. The sleeve 12 is also provided with a hoop 23 for the lowering rope 13 to be attached to. The sleeve 12 can be made out of any convenient materials exhibiting the required mechanical properties. In this embodiment an outer sleeve 24 of stainless steel is provided having a nylon bush 25. Thus the sleeve shown in Figure 2 can conveniently be clamped around the first rope 1 whenever required. This is particularly convenient when a climb is performed in more than one stage as will be discussed hereinafter.

In a two or more stage climb the climber 2 will ascend to a first position such as branch 2. Upon reaching that position he will secure himself and then pass the second end of the first rope (i.e. the end not already attached to the harness 3) over a further branch and secure that end to the harness. Then a second prussik knot will be attached to the first rope 1 and to a further karabiner attached to the climber's harness. Once the climber is satisfied that the rope is secure, the sleeve 12 is released from its lower position around the first rope 1 to a new position above the second prussik knot. The first

prussik knot can then be undone and the first end 4 of the first rope 1 undone and allowed to fall as far as practical in a vertical route to ground. The climber is thus then able to climb in the same manner as for the first stage, with the sleeve being maintained in a position capable of lowering the climber in case of an accident.

Although the example described hereinabove has been directed principally towards a climbing arrangement, the rope arrangement in Figure 1 is clearly applicable to lowering any load from a fixed lowering point by using engagement means to engage an upper portion of the prussik knot 9 from a remote position such as the ground.

CLAIMS

1. A device for remotely lowering a load suspended by a first rope hung over a lowering point, said first rope being attached to said load at one end thereof, and a second rope attached to said load and to said first rope, said first and second ropes forming a loop around said lowering point and said second rope being attached to said first rope by a slip knot which tightens to grip said first rope under the weight of said load; said device comprising engagement means to engage an upper portion of said slip knot from a remote position and to apply a downward pressure to controllably release said grip.
2. A device as claimed in Claim 1, wherein said engagement means comprises a loop portion for looping around said first rope, to engage with said upper portion of said slip knot and a lowering rope attached to said loop portion, wherein said downward pressure can be applied by an operator using said lowering rope.
3. A device as claimed in Claim 2, wherein said loop portion comprises a sleeve.
4. A device as claimed in Claim 3, wherein said sleeve comprises two parts for engagement around said first rope.
5. A device as claimed in Claim 4, wherein said two parts are longitudinally hinged at one side with longitudinal lock means at an opposite side.
6. A method for safely and remotely lowering a load, comprising the steps of hanging a first rope over a fixed

lowering point and attaching one end thereof to said load; attaching a second rope to said load and said first rope such that said first and second ropes form a loop around said lowering point, and said second rope grips said first rope by the action of a slip knot which tightens under the weight of said load; and remotely applying a downward pressure on an upper portion of said slip knot to controllably release said grip.

7. A method as claimed in Claim 6, wherein said downward pressure is applied using a lowering rope with a loop portion looped around said first rope at a position above said slip knot.

8. A method for remotely lowering a load suspended by a first rope hung over a lowering point, said first rope being attached to said load at one end thereof, and a second rope attached to said load and to said first rope, said first and second ropes forming a loop around said lowering point and said second rope being attached to said first rope by a slip knot which tightens to grip said first rope under the weight of said load; said method comprising the step of applying a downward pressure to an upper portion of said slip knot to controllably release said grip.

9. A method as claimed in Claim 8, wherein said downward pressure is applied using a lowering rope with a loop portion looped around said first rope at a position above said slip knot.

10. A method as claimed in Claims 8 or 9, wherein said load is an incapacitated climber.

11. Climbing apparatus comprising a first rope to be hung over an object to be climbed and attached to a climber at one end thereof; a second rope for attachment to said climber and said first rope, such that said first and second ropes form a loop around said object and said second rope grips said first rope by the action of a slip knot which tightens under the weight of said climber; and a rescue device for lowering an incapacitated climber comprising means to engage an upper portion of said slip knot from a remote position and to apply a downward pressure to controllably release said grip.
12. Climbing apparatus as claimed in Claim 11, wherein said engagement means comprises a loop portion for looping around said first rope, to engage with said upper portion of said slip knot and a lowering rope attached to said loop portion, wherein said downward pressure can be applied by a rescuer using said lowering rope.
13. Climbing apparatus as claimed in Claim 12, wherein said loop portion comprises a sleeve.
14. Climbing apparatus as claimed in Claim 13, wherein said sleeve comprises two parts for engagement around said first rope.
15. Climbing apparatus as claimed in Claim 14, wherein said two parts are longitudinally hinged at one side with longitudinal lock means at an opposite side.
16. Climbing apparatus as hereinbefore described with reference to any of the drawings.
17. A device for remotely lowering a load as hereinbefore described with reference to the drawings.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

9119405.0

Relevant Technical fields

(i) UK Cl (Edition K) A5A ; F2X

(ii) Int Cl (Edition 5) A62B; A63B, B66D, F16G

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

C J LUCK

Date of Search

6 JANUARY 1992

Documents considered relevant following a search in respect of claims

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Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

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Wagner

[11] 4,090,584

[45] May 23, 1978

[54] SAFETY BRAKE

[76] Inventor: Nick J. Wagner, 289 Jupiter Dr., Cincinnati, Ohio 45238

[21] Appl. No.: 807,346

[22] Filed: Jun. 17, 1977

[51] Int. Cl.² B65H 59/16

[52] U.S. Cl. 182/5; 188/65.1

[58] Field of Search 182/5, 5, 6, 7; 188/65.1, 65.2, 65.4

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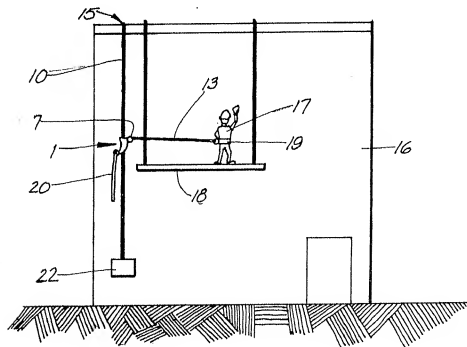
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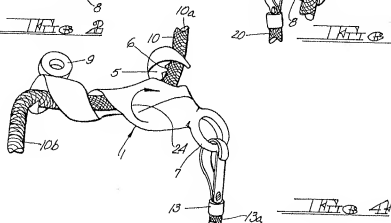
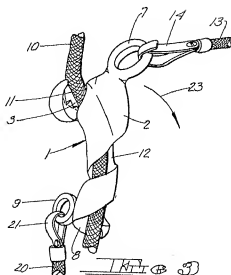
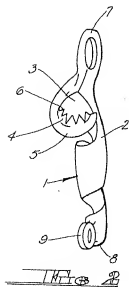
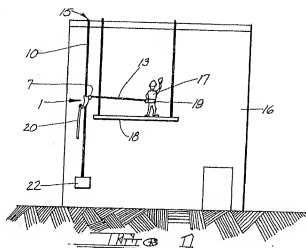
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ABSTRACT

A single piece safety brake having no moving parts for attachment between a safety line secured to a structure and a safety belt line worn by an aerial workman to prevent falls by the workman. The brake comprises a hollow helical guide member with an arcuate axis adapted to permit the safety line to be passed therethrough. A connecting eyelet may be located at one end of the guide member for connecting the safety belt line thereto. A serrated opening having inwardly projecting teeth is provided opposite the eyelet for exerting a drag on the safety line. The brake may be placed at any position on the safety line and easily moved there along by the workman. A downward force applied to the eyelet causes the brake to assume a substantially horizontal position, bringing the inwardly projecting teeth into contact with the safety line to exert a drag thereon and prevent downward movement of the brake along the safety line.

4 Claims, 4 Drawing Figures





SAFETY BRAKE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to safety devices for preventing falls by aerial workman and more particularly to a single piece safety brake for attachment between a safety line secured to a structure and a safety belt line worn by an aerial workman to prevent falls by the workman.

2. Description of the Prior Art

Safety devices for preventing falls by workman, such as window washers and construction personnel, from elevated scaffolding are well known and widely utilized in the construction and maintenance trades. Many of these devices operate in conjunction with a safety line secured to a dependable part of the structure upon which work is being performed, such as the roof or an overhanging ledge, to limit the distance that the workman may fall.

One type of safety device commonly employed with such a safety line comprises a brake which securely engages the line to prevent downward movement. Such brakes, while being widely used in the industry, have presented several disadvantages which have heretofore hindered their utility.

For example, certain brakes employ complex mechanical mechanisms which are subject to wear and maintenance problems, resulting in possible mechanical failure and unreliability. Other brakes, because of their size and weight, are difficult for the workman to move along the safety line as he ascends or descends in his work. This additional distraction of the workman's attention can lead to an increased chance for a fall or other industrial accident. Finally, prior art safety brakes may require disassembly of the safety line structure so that the brake can be connected to the line.

SUMMARY OF THE INVENTION

The safety brake of the present invention seeks to overcome many of the limitations of prior art safety brakes by providing a simplified, single piece safety brake having no moving parts for attachment between a safety line secured to a structure and the safety belt worn by an aerial workman. In general, the brake comprises a hollow helical guide member with an arcuate axis adapted to permit the safety line to be passed there-through. This construction permits the brake to be placed on the line in any position and easily moved therealong by the workman as he ascends or descends.

The brake also includes a connecting eyelet which may be located at one end of the brake for connecting the safety belt line of the workman thereto. A serrated opening having inwardly projecting teeth is provided opposite the eyelet for exerting a drag on the safety line in the case of a fall. During such a fall, a downward force is applied to the eyelet through the safety belt line causing the brake to assume a substantially horizontal position, thereby bringing the serrated teeth into contact with the safety line to exert a drag on the line and prevent further downward movement of the brake along the line. Hence, the downward movement of the workman is arrested preventing potentially serious injury.

An additional eyelet connector may be added near the lower end of the brake to which a short length of rope may be attached so that the brake may be easily

moved along the safety line by the workman to any convenient position. Attachment to the eyelet may be made by snap hooks or any other convenient fastener.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a pictorial representation of the safety brake of the present invention in use in a typical working environment.

FIG. 2 is a perspective view of the safety brake of the present invention.

FIG. 3 is a fragmentary perspective view of the safety brake of the present invention showing the safety line, safety belt line and auxiliary guide rope connections, with the brake in the normal operating configuration.

FIG. 4 is a fragmentary cut-away view of the safety brake of the present invention shown activated in a fall preventing position.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The safety brake of the present invention is shown generally at 1 in FIG. 2. The brake comprises a hollow helical guide member 2, having an arcuate axis, as is best shown in FIG. 3. As shown in FIG. 2, the upper end of guide member 2 terminates in an inlet opening 3. Rope engaging means 4 are located adjacent opening 3 and comprise a serrated cusp 5 having a plurality of inwardly projecting teeth 6.

A connecting eyelet 7 is formed as an integral part of guide member 2 and is located adjacent opening 3 and opposite rope engaging means 4. Eyelet 7 may be used to connect a suitable safety belt line to an aerial workman, as will be explained in more detail hereinafter.

As shown in FIG. 2, the lower end of helical guide member 2 terminates in an outlet opening 8. A second eyelet 9 is located adjacent outlet 8 for connecting to an auxiliary guide rope, the function and construction of which will be explained hereinafter.

Turning now to FIG. 3, the attachment of safety brake 1 to a typical safety line will be explained in detail. Safety brake 1 is oriented parallel to safety line 10 so that the brake is essentially vertical and upper connecting eyelet 7 is positioned above lower connecting eyelet 9. Safety line 10 is inserted into opening 11 of inlet 3, and the entire brake rotated in a counter clockwise direction as viewed from above until safety line 10 completely passes through the hollow opening 12 of helical guide member 2 with the lower end of safety line 10 emerging from outlet 8. Using this procedure, it will be understood that brake 1 may be inserted at any place along safety line 10 without the need to disconnect either end of the line.

Having thus positioned brake 1 on the line 10 in the desired location, a suitable safety belt line, a portion of which is shown at 13, may be connected to connecting eyelet 7 by any suitable fastening means, such as snap hook 14.

The completed safety brake insulation is shown pictorially in FIG. 1. Safety line 10 is secured to a structurally reliable portion 15 of building 16 by any suitable fastening means. Safety line 10 is kept taut by a weight 22, such as a conventional concrete block, secured to the lower end of the line. Safety brake 1 is attached to line 10 at approximately the working elevation of workman 17 as described heretofore. As shown in FIG. 1, workman 17 may be supported by a separately secured scaffolding 18. Safety belt line 13 is securely attached to the workman's safety belt 19 at one end, and to connect-

ing eyelet 7 located on brake 1 at the other, as described heretofore. As can be seen, safety brake 1 will be free to move along safety line 10 as workman 17 ascends or descends.

An additional auxiliary guide rope, a portion of which is shown at 20 in FIG. 3, which may be of any convenient length, may be attached to lower connecting eye 9 by means of snap hook 21 or a similar fastener, to enable a workman to more easily slide brake 1 along safety line 10 as he ascends or descends the face of the structure.

As can be seen in FIG. 3, the arcuate shape of the central passage 12 of brake 1 imparts a slight bight to safety line 10 to produce a slight sliding friction between brake 1 and line 10. This slight sliding resistance permits brake 1 to maintain a desired position on line 10 with respect to workman 17, thereby preventing the brake 1 from sliding to a lower position on line 10 and hence becoming a burden to the workman. In addition, it will be observed that brake 1 will tend to maintain its relative vertical position on line 10 as workman 17 moves horizontally along scaffolding 18 during the course of his work.

FIG. 4 illustrates the position of brake 1 on line 10 when the workman 17 has fallen from scaffolding 18. Line 10 is shown severed at points 10a and 10b for greater clarity. As before, it will be understood that severed end 10a continues to a point of attachment 15 near the top of building 16, while severed end 10b continues to a point of attachment to weight 22. It will be further understood that safety belt line 13, shown severed at 13a for convenience, continues to a point of attachment on safety belt 19. Finally, snap hook 21 attached to auxiliary guide line 20 has been deleted from FIG. 4 for clarity.

It will be observed that when a downward force is applied through safety belt line 13 to eyelet connection 7, such as might be produced by the fallen workman, safety brake 1 will be caused to rotate in the direction shown by arrow 23 in FIG. 3, to assume the essentially horizontal position depicted in FIG. 4. In the fall-arresting position of FIG. 4, safety belt line 13 hangs substantially vertically due to the weight of the fallen workman at its end. Likewise, the lower end of safety line 10 also assumes a substantially vertical position by reason of weight 22 attached to the lower end of line 10. It will be understood that the mass of weight 22 is such so that as to permit safety line 10 to assume the Z-shaped bight shown in FIG. 4.

The rotation of safety brake 1 to the position shown in FIG. 4 causes cusp 5 and the inwardly projecting teeth 6 associated therewith to engage the portion of safety line 10 passing adjacent thereto, thus preventing slippage of the brake 1 with respect to line 10, and arresting the fall of the workman. As long as a downward force continues to be exerted on connecting eye 7, the pivotal moment depicted by arrow 24 in FIG. 4 will

continue to be produced, thereby continuing to urge teeth 6 against the outer surface of line 10. When the downward force has been removed on connecting eye 7, brake 1 may be returned to its normal upright position, as shown in FIG. 3, thereby permitting brake 1 to slide along line 10. It will be observed that while brake 1 insures a simple reliable method for arresting the downward motion of a fallen workman, damage to line 10 resulting from engagement with teeth 6 and cusp 5 is minimized, thereby permitting complete reusability of both brake and safety line.

It will be understood that various changes in the details, materials, steps and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principal and scope of the invention as expressed in the appended claims. For example, the particular configuration of helical guide member 2 may be altered as to size and number of turns forming the helix to accommodate specific types or sizes of safety lines. In addition, alternative connecting devices may be used in place of connecting eyelets 7 and 9, for example, threaded fasteners, etc.

I claim:

1. A safety brake for attachment between a safety line secured to a structure and a safety belt line worn by an aerial workman to prevent falls by the workman, said brake comprising a hollow arcuate axis helical guide member having an inlet and outlet located at opposite ends thereof and adapted to receive the safety line therethrough, connecting means adjacent said inlet for attaching to the safety belt line, and rope engaging means adjacent said inlet and said opposite connecting means for exerting a drag on the safety line, said brake being adapted to be placed at any location on the safety line with said inlet positioned above said outlet and to be moved by the workman therealong, said brake being adapted to pivotally assume a rope engaging position upon a downward force applied to said connecting means along the safety belt line whereby said engaging means may be caused to contact the safety line to exert a drag thereon for preventing downward movement of said brake along the safety line.

2. The safety brake according to claim 1 wherein said guide member includes connecting means adjacent said outlet for attaching to an auxiliary guide line for moving said brake to any position along the safety line.

3. The safety brake according to claim 2 wherein said connecting means comprise eyelets for accepting a snap hook thereon.

4. The safety brake according to claim 1 wherein said rope engaging means comprises an arcuate cusp having a plurality of sharpened rope engaging teeth projecting inwardly of said cusp toward the safety line for engaging the line.

* * * * *

10. RELATED PROCEEDINGS APPENDIX

There is one other known appeal that is related to the present case. Namely, U.S. Patent Application Serial No. 10/982,033, filed on November 5, 2004, which is a divisional of the present application, is currently under appeal. No decision has been rendered.

There are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this Appeal.